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**P**IECE work and team work, so long the acme of production effectiveness in great manufacturing establishments, are beginning to look antiquated when compared with processional work. At bottom its basis is simplicity itself and is of this sort. Say that in days past a blacksmith struck a piece of iron twenty blows to secure a certain result. Processionally there would be twenty blacksmiths ranged before twenty anvils. The iron brought before each pauses only long enough to be smitten once and passes to the next. The first blacksmith has just time enough to raise his hammer when another piece of iron is in place to receive its blow. A man who misses a blow promptly loses his job. Each worker must do his part at just the right moment or it gets by him. Active and alert men are required and the pay, by the day, is exceedingly high—and the amount of work accomplished is tremendous. Of course, the iron hammering description is only by way of explanation. Such work would be done by machinery. But processional

work has already been adopted in automobile manufacture, and wherever it is adaptable to rubber work it is sure to be tried out.

**THE UNIVERSALITY OF THE RUBBER STAMP.**

**I**T is not contended that the rubber stamp is quite on the same plane of importance as the rubber tire, for instance. In value of annual product these two commodities stand in about the ratio of fifty to one. The car owner's annual contribution to the rubber industry aggregates approximately \$200,000,000. That of the stamp user is about \$4,000,000.

But in one particular the stamp far surpasses the tire—in its universality. Bankers, merchants, office boys, farmers' wives, young girls with a dozen handkerchiefs, all use them. There are 12,000,000 tires in use in the United States today, while of rubber stamps there are 100,000,000. Someone may say "That's a rubber stamp for every person—man, woman and child—not to mention infants in arms." Quite true. There are not 100,000,000 stamp-owners, but over against the ten men who use none is the man who uses a four-story rack full of them.

The rubber stamp does its work faithfully and cheerfully until it is worn out in service, and dies in the harness. It has the supreme virtue of unfailing reliability—it tells the same story day after day and never deviates a hair's breadth.

In fact it has become so generally recognized as a symbol of docile, unquestioning obedience that when one statesman wants to charge another with too unfaltering loyalty to somebody else he invariably calls him a "rubber stamp."

**A PESSIMISTIC PROPHECY.**

**A** NEW YORK financial sheet recently sent to its subscribers a confidential communication, which it claimed originated with a leading bank interest in New England, that should surprise the rubber trade. The advice, which was in the nature of a warning, claimed:

First—That the production of plantation rubber had reached its maximum, due to overtapping of the trees.

Second—That a white ant pest was retarding rubber production.

Third—That reclaimed rubber could not be relied upon to take the place of crude.

Fourth—That higher prices for tires were to be expected.

An expert who does not know a tapping test from a tuning fork, a white ant from a whipparee, or reclaimed rubber from honeycomb tripe is perhaps not to be taken seriously when he talks rubber. Nevertheless, with the hope that this catches his eye, we submit the following

facts: Plantation production has not begun to approach its maximum. Not only will existing plantations show an increase next year, but hundreds of thousands of trees just coming into bearing will add to the aggregate in rubber production. In addition, thousands of small plantings by natives all through the Far East will add their product. As for white ants, they have been fought from the beginning and are not a menace, as they are well under control. Further, few trees have been overtapped, and no danger is to be feared from this source. As to reclaimed rubber, it is not "dead," but by modern processes just as live as new rubber.

One statement is perhaps correct. Tire prices, because of higher labor, more costly cotton and compounding ingredients, may advance.

We congratulate the New England banker-prophet upon scoring one point out of four—75 per cent wrong is better than the usual 100 per cent.

#### ASBESTOS AND ITS EMBARGO.

AN order in council by the government at Ottawa, Canada, in March of this year, placed an embargo on the shipment of asbestos from Canada to other than British ports, but permitted shipments to the allied countries, France, Russia, Italy, Japan, and Portugal, on special licenses granted by the British consul. The announcement of this order was received with alarm by users of asbestos in the United States, and a vigorous protest was at once filed. It was shown that practically 90 per cent of all the asbestos used in this country comes from Canada, and this shutting off of supplies would cripple several important industries. It was demonstrated to the government at Ottawa that a great hardship would be entailed, and the embargo has been modified to the extent of permitting shipments of crude asbestos to enter the United States if guarantees are given by the manufacturers and their customers that none of the crude or manufactured material will be re-exported, except as provided for in the original order.

For the last few years we have been importing annually from 60,000 to 76,000 tons, of a value of from \$1,378,000 to \$1,678,000, and practically all of this came from Canada, about 200 tons being imported from Europe. In no year previous to 1914, has the total domestic output amounted to 8,000 tons, while the average is less than 4,000 tons per year, and in 1913 and 1914 it was less than 1,300 tons.

Rubber manufacturers are using steadily increasing

quantities of asbestos, chiefly in packings and automobile brake lining. The latter is a narrow asbestos fabric impregnated with rubber and vulcanized. That it is an important product may be inferred from the fact that the 3,000,000 or more automobiles in this country, and the 200,000 trucks, have certainly two, usually four brake linings. The total length of such lining needed for a single car is about ten feet. This of itself would make about 37,000,000 feet—a tremendous production. And when it is considered that such linings wear out in use, and must be renewed, it will be seen how important is this one branch of the asbestos-rubber industry.

The raw material is also used for clutch lining. About 35 per cent of 1916 models of automobiles have dry disk clutches, and while the amount used for this purpose is small, compared with that used for brakes, still in the aggregate, this is, in itself, an important addition to the business.

There are, of course, other uses for asbestos in the rubber trade. All manufacturers of mechanical rubber goods use this material, chiefly in packings.

The action of the Canadian Government has brought vividly to the minds of American manufacturers their dependence upon imports of asbestos. Investigation as to the resources of our own country as reported by the United States Geological survey shows that in 1915 there was a great increase in the production of high-grade asbestos in Arizona. The lower grade asbestos produced in this country comes mainly from Georgia. Both Arizona and Georgia are capable of increasing their output. Virginia, ten years ago, produced a small quantity of low-grade asbestos and in 1911 Vermont had a productive mine, largely of the chrysotile variety, in the same belt of rocks that contain the rich deposits in Canada. For the last few years the mine has not been in operation. Asbestos has also been reported in the Casper Mountains and other regions in Wyoming and there are deposits in Idaho of about the same quality of material as that in Georgia. California has produced some low grade asbestos.

However, as far as rubber manufacturers are concerned, it is probable that they will continue to use the Canadian product, submitting to the conditions required by the Dominion Government, which are practically the same as these manufacturers have agreed to with the British Government with regard to the importation of crude rubber and the exportation of rubber manufactures.

## Rubber in the Construction of Aeroplanes.

**T**HE balloon has not received as much attention in America as in Europe. Americans have never believed that it would become really practical, and heavier-than-air machines have possessed more attraction for our inventors. The problem of mechanical flight has given birth to many chimerical plans and projects, but the fact remains that, although most of the earlier theoretical literature on the subject came from France, practical results with machines heavier than air were first obtained by Americans.

As far back as 1894, Hiram Maxim, an American residing in England, constructed a flying machine, provided with a steam engine, which showed flying capability but lacked stability. Professor Langley, secretary of the Smithsonian Institution at Washington, built several working models of flying machines propelled by steam engines, of which two, in 1890, made aerial flights of about a mile. Then followed, also in America, the remarkable "gliding" experiments of Lilienthal, Chanute, Herring and finally of the Wright brothers who, as far back as 1902, had completed gliders possessing most of the refinements of modern aeroplanes, minus the motor. Since Wilbur Wright made his historical flight in 1908—the first mechanical flight worthy of the name—gigantic strides have been made towards perfection in navigating the atmosphere with machines heavier than air, and thousands of successful aeroplanes of many types have been produced. The flying machine has proved its value both as a vehicle of sport and as an instrument of war. The new industry has been growing rapidly all over the world. Forty American aeroplane factories are now working full force on foreign government orders for flying machines, and consequently it seems quite worth while to go somewhat into details concerning this industry and the extent to which rubber is used in the construction of aeroplanes.

### AEROPLANE CONSTRUCTION.

There are four important ways in which rubber is used in the construction and use of aeroplanes: First, in the pneumatic tires with which the wheels are equipped; second, in the rubberized fabric for covering the wings and other surfaces; third, in the construction of shock absorbers, and fourth, in the equipment of the aviator and passengers.

All aeroplanes—some water-aeroplanes excepted—are equipped with wire wheels similar to motorcycle wheels and provided with pneumatic tires which are either cemented, glued or attached with lugs to the rims of the wheels. The Dunlop type of tire is most favored for aeroplane service on account of the facilities it offers for light construction. The size of wheels and tires varies with the type of machine. Aeroplane tires must be attached very tightly to their rims, for the slipping off of a tire is even more dangerous to an aviator bringing his machine to earth

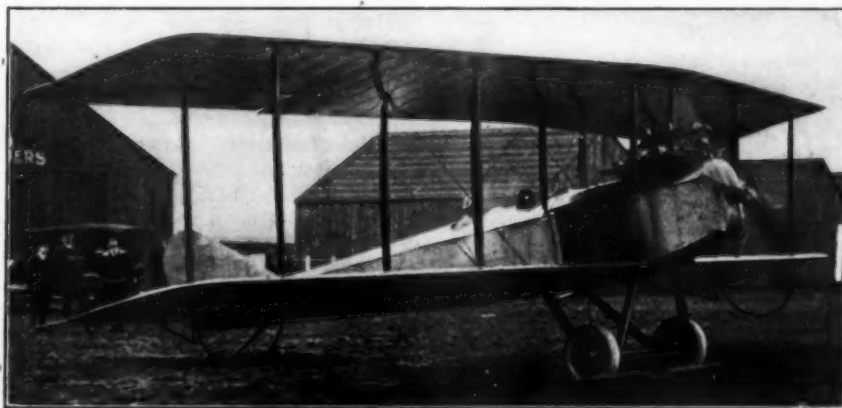
than it is to an automobilist taking a corner on the road. Aeroplane tires must have great resiliency and strength of fabric to withstand the terrific shock when an aeroplane alights on rough, uneven ground. A blow-out at such a moment might prove fatal. The plain tread is perhaps most used, although aeroplane tires are also made on the non-skid plan. The tire and the rims of the wheels of aeroplanes should be constructed so as to make rim-cuts impossible even when the landing shock flattens out the tires.

### AEROPLANE FABRICS.

Fabrics play an important role in aeroplane construction. As long as the cloth covering the sustaining planes of a flying machine stays taut in all kinds of weather, little attention is paid to it, but when it alternately shrinks and stretches, when it shows itself as sensitive as a hygrometer to the presence or absence of atmospheric moisture, aviators and aeroplane constructors soon realize the importance of aeroplane cloth. The quality of the cloth affects the efficiency and even the safety of

a flying machine. Aeroplane cloth must be moisture-proof, heat-proof and cold-proof, and it must not oxidize in the sun or become affected by gasoline or engine oil.

The following fabrics are used in the construction of aeroplanes; Cotton canvas, either unbleached or colored in yellow, and weighing from 145 to 150



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AEROPLANE FLOWN DURING THE NEW YORK PREPAREDNESS PARADE, MAY 13, 1916.

grams (4.90 to 5.07 ounces) per square meter (10.764 square feet), is used single-fold for covering the sustaining surfaces of flying machines. The tensile strength of this canvas is from 2,200 to 2,800 pounds per running yard and its thickness about 0.18 millimeter (0.007 inch). Some constructors use cotton canvas weighing from 180 to 200 grams (6.34 ounces to 7.05 ounces) per square meter (10.764 square feet), having a tensile strength of about 2,600 pounds to the running yard and a thickness of about 0.18 millimeter (0.007 inch). Flax fabrics or linen are most used. Linen fabrics weigh about 145 grams (4.90 ounces) to the square meter (10.764 square feet) and their tensile strength is in the neighborhood of 3,600 pounds to the running yard or 18.80 pounds to the square millimeter (0.00155 square inch), while their thickness is around 0.20 millimeter (0.0078 inch). Silk fabrics, though stronger than others for their weight, are not used in the construction of aeroplanes on account of their excessive cost.

French constructors use quantities of ramie fabric. This weighs 120 grams (4 ounces) per square meter (10.764 square feet), its tensile strength is 2,120 pounds per running yard, or 13.64 pounds per square millimeter (0.00155 square inch), and its thickness 0.17 millimeter (0.0066 inch). Ramie fabrics are very tough and hard to tear.

### MAKING THE FABRIC MOISTURE PROOF.

Rubberized fabrics were used almost exclusively for covering



the sustaining surfaces of the first aeroplanes, but the rubber industry had been taken unawares and the rubberized fabrics then obtainable were not well suited for the requirements of aeroplane construction and they soon fell in disfavor because the best of them absorbed a certain amount of humidity, stretched, and thus lost their rigidity. Canvas, coated with acetate of cellulose,



Photograph from Underwood & Underwood.

#### SHIPPING U. S. ARMY AEROPLANES INTO MEXICO

lose, took the place of rubberized fabrics in the construction of aeroplanes because such canvas is supple and at the same time little affected by the weather. The plain canvas was first stretched and fastened tightly to the frame of the machine and then coated with acetate of cellulose varnish. Acetate of cellulose applied in the form of a collodion tightens cloth that is stretched on a frame; it makes the cloth waterproof without making it stiff and brittle as nitrocellulose does; it does not crack and it is not inflammable. Acetate of cellulose varnishes used in the early days of aviation were diluted with chloroform, but this solvent was soon dropped on account of its high cost and the danger in its use. At the present time two sorts of acetate of cellulose varnishes are used—varnishes that give a rigid coating and those that give supple coatings.

#### RUBBERIZED FABRICS.

The use of rubberized fabrics in the construction of aeroplanes is not so extensive as it is generally believed to be. Aeroplane manufacturers and aeroplane users are still under the influence of the prejudice developed in the early days of aviation when proper rubberized fabrics for this purpose were not to be obtained. The fabrics available in the pioneer days of aviation were rubber-coated and not impregnated with rubber as they are now. The result was that the rubber coating cracked and peeled off, allowing moisture to penetrate the fibre of the fabrics, causing them to alternately shrink and stretch. Modern rubberized aeroplane fabrics present no such difficulties, and aeroplane builders are now beginning to give them the consideration they deserve.

Rubberized balloon fabrics are made either of linen or of cotton and they are thoroughly impregnated and saturated with rubber applied gradually by a series of operations. Manufacturers have learned to make them absolutely weather-proof and lasting. Besides being thoroughly saturated with rubber, modern rubberized aeroplane fabrics are generally coated with rubber solution on both of their surfaces. These coatings are so light that rubberized aeroplane fabrics are no longer open to objections on the score of weight, as was formerly the case. The process of preparing these fabrics is quite similar to that used in the preparation of balloon fabrics already described in a preceding article on the subject. Aeroplane fabrics are made in all colors or, like some of the balloon fabrics, are metallized with aluminum.

#### SHOCK ABSORBERS.

All aeroplanes are provided with a running gear which invariably includes a system of shock absorbers built to protect

the machine as well as the aviator from too violent shocks when leaving and when returning to earth.

The Blériot type of rubber springs or shock absorbers was at first built up of fine rubber strands bundled together, covered with a cotton fabric, the ends of the strands being firmly held in metallic clamps constructed in such a manner as to facilitate the fastening of the spring to the landing gear of the aeroplane. It was, however, discovered that the fine rubber strands soon decayed from oxidation and their place was taken by molded rubber vulcanized to give proper tensile strength and elasticity.

The Farman type of aeroplane spring is used in attaching the axle on which the wheels are mounted, to the skids of the flying machine. Two or more rubber rings are hooked to one side of the skid, then brought over the axle and fastened to the other side of the skid. These rings are made of either red or of bluish-gray stock compounded so as to be strong enough to withstand heavy strain and with the exact degree of elasticity to allow proper elongation and no more. These types of rubber shock absorbers vary widely with the type of machine and of landing gear used. For aeroplane shock absorbers rubber is unrivalled on account of its light weight and extraordinary elasticity. Metal springs, hydro-pneumatic shock absorbers and the like are used but not nearly to the extent that rubber is.

#### EQUIPMENT OF THE AVIATOR.

Aviators, when flying, use rubber and rubberized fabric clothes almost exclusively. These are made in all colors and afford perfect protection against weather. Aerial waves make riding in an aeroplane comparable to riding a bucking bronco and aviators are obliged to fasten themselves to their seats lest they be thrown out by the violent bounding of their machine.

Here again rubber is used in the shape of a rubber belt which the aviator passes around his waist and fastens to the machine with leather straps. Such a belt not only prevents the aviator



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#### UNITED STATES MILITARY AEROPLANE IN MEXICO.

from being thrown out of his machine but, in case of accident the elasticity of the rubber acts as a fall-breaker. This type of rubber belt is generally composed of two pieces held together by a miniature coupling pin. By pulling out the coupling pin the flyer can immediately free himself from his machine.

Many aviators use hard rubber helmets to guard their heads in case of accident and rubberized gloves to protect their hands and forearms from cold and rain. As in dirigibles, the navigating instruments used in aeroplanes are generally held in place by soft, elastic rubber attachments which prevent excessive vibration and violent shocks reaching the delicate mechanism of these instruments. The upholstering of aeroplane seats is often made of rubberized fabric inflated with air. Aviation, like aërostation, presents numerous and extensive applications of rubber and offers an interesting field to the rubber manufacturer, and one that may in the future grow into much larger proportions and become of still greater importance.



## The European Rubber Trade After the War.

*Written by a German, well posted on general conditions of the European rubber industry, this article gives the writer's forecast of the manner in which the European rubber trade will be resumed after the war.*

A VERY conservative estimate made according to the actual business done during the year 1913 shows that the total international turnover in rubber goods represented by the sum of the imports and exports from one to the other of the countries now at war was about \$40,000,000, or five-sixths of the total interstate rubber trade of Europe.

Of the rubber goods imported into Germany, amounting to approximately \$6,500,000, about \$600,000 came from France. England supplied \$2,300,000 worth, Russia \$1,000,000, Austria \$450,000 and Belgium \$250,000. Germany in return sent about \$3,500,000 worth to France; England bought for her own use and for her colonial trade, shipped via London, about \$6,500,000; Russia received somewhat less than \$2,000,000; Belgium about \$750,000; Austria \$2,500,000; Italy \$5,000,000, and Turkey \$150,000.

Taking the case of England, it appears that apart from the business done with Germany, she bought from Belgium about \$350,000 worth of rubber goods; France supplied her with \$700,000 worth and she received about \$200,000 worth from Austria. Italy is also well represented in the British market. The English figures are far from complete, giving only tires, footwear and general goods, while many others are hidden under different class headings, as, for instance, electrical goods.

Looking at the export side of the British trade exchange, it appears that Belgium received goods to a value of \$850,000; France \$2,000,000; Russia \$250,000, and Turkey about \$100,000. The trade to Italy consisted very largely of tires and raw materials.

Belgium bought from Austria goods to the value of \$50,000 and sold her three times that amount. France sold Austria \$250,000 worth of rubber goods and in return bought half that quantity, while honors were practically even between Austria and Russia, each exchanging goods worth slightly over \$120,000.

From European letters, as well as from opinions of travelers, the feeling seems to be that the war will be followed by marked changes in the character and channels of European business. It is pointed out that the relations between the two largest competitors, England and Germany, may be restrained for a considerable time. This would doubtless necessitate a complete reorganization of the whole European market, if not that of the world.

Until the beginning of the war, the German rubber industry regarded London as a large clearing house for trade passing between Germany and the British colonies. The London shippers had acted as intermediaries, and regret is expressed that the continuance of this profitable trade relationship may be endangered by the war.

There were in London many firms representing the interests of the German rubber industry, including some of the largest concerns handling rubber goods in the British market, such as the Continental, Metzler, Calmon, and Harburg-Wien. The management of the latter house in England was completely in the hands of English interests and the same condition has existed with British firms in Germany, such as the Dunlop Rubber Co., Limited, which has a large German plant. In many of the less prominent houses, there were employed in both countries a large number of agents doing business for England in Germany and for Germany in England.

The relations between the representatives of the rubber industries of both countries and the buyers of such goods were most cordial. They found their expression repeatedly in the participation of the German manufacturers in the International

Rubber Exhibitions, the last of which closed shortly before the outbreak of the war. It is claimed by some that the interests of these firms are so clearly interwoven that after the war a re-establishment of relations may be possible and that the feeling of distrust which undoubtedly will be left may speedily be overcome. This applies equally well to the relations between the Austrian and British merchants.

Before the war Italy not only bought from Germany a fairly large quantity of tires, but the German exports to Italy of mechanical rubber, hard rubber goods, etc., had been large. This trade has entirely ceased since the outbreak of the war. What the commercial relations between these countries will be after the war, is problematical.

It is difficult to predict how the war will affect the relations between Italy and Austria. These countries after previous wars have soon returned to peaceful trading again. Hence, one may anticipate a fairly early resumption of their commercial intercourse when the political difficulties have been removed.

As an exporter of rubber goods, Italy has never exerted a strong influence upon European trade, although Italian manufacturers had built up a satisfactory export business and the London market was well supplied with Italian goods. Those made by Pirelli & Co. are especially well known. This firm and other Italian manufacturers may benefit after the war by any decrease in German exports to England.

The situation between Germany and France presents greater difficulties, for between their rubber industries considerable competition has existed for some time past which, as an industrial conflict, has been shown by boycotts and in other ways. It is said that the French market was fast becoming of less value to the German manufacturers. Opinions seem to indicate that after the war this trade will cease altogether.

France is not producing all the rubber goods she needs and the lack of German imports, having a value of about \$3,500,000, should have a decided effect on the French rubber trade. If, after the war, cordial commercial relations are not resumed with Germany, France will either be compelled to expand the producing power of her rubber industry immensely or she will have to look about for some other source of supplies.

It should be remembered that France has built up an export trade, especially in tires. The French tire industry has gained a large export demand, mostly through the fame of her motor industry. French motor cars winning races all over the world have helped to introduce the tire products of the French rubber manufacturers, who have taken good care of the openings thus made. French tires were sold in large quantities in the British and other European markets, and French manufacturers are of the opinion that they will be able to replace German tires in England after the war. How far this will be possible will depend upon conditions existing at the conclusion of peace.

The German rubber goods sold in France consisted largely of mechanical goods and tires. The former may not be easily replaced by French makers, as the demand for this class of goods promises to become enormous. Tires are a French specialty which the domestic manufacturers are able to furnish in sufficient supply for home consumption.

The English rubber industry naturally is in a more favorable position than that of the other countries at war, for England has been able to keep her export business open. The strength of London is in its capability to distribute goods. In the past it has acted mostly as a receiver or intermediary for the continental rubber industries. Whether it will retain this position

will depend largely on the settlement of the British dispute with Germany.

The increasing influence of Antwerp must not be forgotten. This city has made great progress in former years and it is predicted that its position after the war will be still more influential, endangering not only London as a distributing center but Hamburg as well. The realization of the immense possibilities of Antwerp dates back to the middle of the last century. Only the great financial influence exerted by London has kept it from becoming the most important port of Europe.

Conditions in Russia are not clear. It is said that in Russia the sentiment has been very favorable to Germany and consequently it is thought that no great difficulty will be encountered in returning to normal trading conditions. Some merchants feel that the war will have but little influence on the turnover of German and Austrian rubber goods in Russia.

The markets affected by the war are producing about half of the rubber goods made in the world, and these markets are consuming a large part of that which is made. The important question for manufacturers to ask is: Will the volume of trade in rubber goods increase or decrease after the war?

At present the general opinion seems to be that for the first few years after the war the production in the rubber industry of Europe will increase by leaps and bounds, provided there is sufficient raw material available. Rubber goods of great value have already been destroyed, and more will be wasted before the war comes to an end. These goods must needs be replaced.

At this time, one cannot predict with any degree of certainty whether a decrease of the general rubber trade may be expected after the readjustment of European economic conditions. The increasing use of automobiles and possible new uses for rubber may bring added business to the industry of Europe and prevent a serious falling off of manufacturing when the rush of after-war orders have been filled.

#### NEW FORM OF RUBBER GUARANTEE.

THE British Consul-General at New York has informed the secretary of The Rubber Club of America, Inc., of a change in the rubber guarantees required by that government. These read the same as the previous forms, with the exception of one paragraph, which now reads:

We will not sell the rubber now delivered by you [nor any raw rubber, reclaimed rubber or waste rubber, whether the same has been imported from British Dominions or not] to any dealer or other person or persons in the United States, but will use it for our own manufacturing purposes.

The addition to the former forms is enclosed in brackets. Other than this, the entire guarantee remains as before.

In addition, a new form, No. 3, is presented, which is required to be signed by reclaimers, in respect to scrap or waste rubber imported from Great Britain or British possessions. This reads:

In consideration of your consenting to the delivery to me of the rubber specified in the margin, I undertake that I will not, directly or indirectly, at any time so long as Great Britain is at war with any European country, export any raw rubber, reclaimed rubber, waste or scrap rubber from the United States, except to the British Dominions, and that I will not sell any raw rubber, reclaimed rubber, waste or scrap rubber for exportation without satisfying myself that it is not intended for exportation from the United States except to the British Dominions.

I further undertake that I will not sell any raw rubber, reclaimed rubber, waste or scrap rubber to any person, firm or corporation in the United States without satisfying myself, so far as possible, that the purchaser has signed the British Rubber Guarantee.

#### RECENT BRITISH RULING ON INSULATED WIRE.

The British Government has recently decided that on account of their military importance, insulated electric wire, cables and wire of all descriptions, even though containing 5 per cent and less of rubber, must be shipped by way of the United Kingdom.

#### RUBBER TRADE INQUIRIES.

*THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.*

[168.] A correspondent desires the names of manufacturers of rubber tissue.

[169.] An inquiry has been received for the address of a reliable maker of rubber enemas, manufactured in one piece without any connection part.

[170.] A special type of jelutong is desired in quantity by a rubber cement firm.

[171.] Names of tire fabric makers have been requested.

[172.] A rubber factory promoter seeks information regarding a continuous process tire building machine.

[173.] A Canadian concern desires to be placed in touch with manufacturers of rubber valve cutting machines.

[174.] Names of dealers in rubber scrap have been requested.

[175.] A correspondent seeks information regarding a thorough test for cured rubber.

[176.] A rubber manufacturer seeks information to aid in the cure of a poison rash affecting a workman who handles compounds and several grades of rubber.

[177.] Inquiry has been received for names of manufacturers of grinding mills ordinarily used for grinding or pulverizing junk or scrap rubber for reclaiming purposes.

[178.] Information is desired by a correspondent on the dipping process in the rubber industry.

#### TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Spanish agent desires to represent American manufacturers of rubber tires for carriages and automobiles. Report No. 20,856.

Full information from American manufacturers of insulating materials is desired by an applicant in an insular possession. Report No. 20,905.

A firm in the Far East requests catalogs, quotations, etc., from American manufacturers of rubber supplies, such as gloves and hot water bags. Report No. 20,908.

Commercial relations are sought by a Brazilian firm with American importers of rubber. Report No. 20,969.

An applicant in Australia would like to communicate with American manufacturers of rubber goods for druggists. Report No. 20,993.

Catalogs and price lists are solicited by a firm in Italy from American manufacturers of toys, rubber balls, etc. Report No. 21,059.

There is a growing demand for chewing gum among the Chinese. Names of firms and others interested may be obtained. Report No. 21,092.

Commission agents in Greece would like to be placed in touch with American exporters of dress shields. Report No. 21,100.

A merchant in Spain desires to import rubber, gutta percha and celluloid articles. Report No. 21,129.

An agent in Norway wishes to represent American manufacturers of electrical insulated wires, tubing, etc. Report No. 21,232.

An applicant in Denmark is in the market for American rubber combs. Report No. 21,243.

\* \* \*

Sealed proposals for 200,000 yards of waterproof fabric will be received until June 12 at the office of the Depot Quartermaster, Boston, Massachusetts, for furnishing at either the Boston, New York or Philadelphia depots of the Quartermaster Corps, United States Army.

## What the Rubber Chemists Are Doing.

### SYNTHESIS AND STRUCTURE OF CAOUTCHOUCS.

THE researches of I. I. Ostromyslenski and F. F. Koschelev on the chemistry of caoutchouc are here condensed from the abstracts published in the Journal of the Society of Chemical Industry (March 31, 1916). The authors find that much of the work published since 1911 on the polymerization of the diolefines is inaccurate and many of the patents are useless. These papers describe peculiar processes of isomerization of two different forms of isoprene-caoutchouc and methods for the catalytic polymerization of diolefines, both to normal and abnormal caoutchoucs. These methods give practically quantitative results.

Caouprene bromide is identical with the symmetrical bromide of erythrene-caoutchouc. Removal of hydrogen bromide from either yields dehydrocaouprene and a homologous compound is similarly obtained from the bromide of natural Para caoutchouc.

Reduction of caouprene bromide by zinc dust yields erythrene-caoutchouc and more or less isomeric caouprene. Caouprene is transparent and forms either a viscous liquid or an amorphous, elastic mass. Benzoyl peroxide at 140 to 158 degrees F. converts caouprene into normal erythrene-caoutchouc.

### SYNTHESIS OF NATURAL CAOUTCHOUC BY WAY OF B-MYRCENE.

Isoprene heated cautiously at 176 to 194 degrees F. yields B-myrcene. This hydrocarbon is a colorless, mobile liquid, soluble in all the organic solvents. When heated with sodium and barium peroxide at 140 to 158 degrees F. it is converted quantitatively into normal isoprene caoutchouc, whereas under similar conditions isoprene gives an abnormal caoutchouc.

### STRUCTURE OF CAOUTCHOUCS.

The bromide of natural caoutchouc is homologous with caouprene bromide and possesses unicyclic structure. Under the action of zinc dust it is converted readily and quantitatively into free caoutchouc; therefore the latter possesses a unicyclic structure. Willstätter has shown that multi-membered unicyclic groupings of unsaturated hydrocarbons are readily transformed into polycyclic groupings, and Harries has proposed for natural caoutchouc a structure in which such isomerism is assumed. That free caoutchouc and its halogen compounds possess unicyclic structures has been demonstrated experimentally.

The conversion of unsaturated compounds into cyclic compounds may be regarded as a process of intramolecular polymerization. For example, in the polymerization of vinyl bromide, at the moment when the trimeride appears, the action proceeds in two directions: (1) A small part of the trimeride undergoes intramolecular polymerization with formation of the stable six-membered ring compound, 1,3,5-tribromocyclohexane; (2) The remainder of the trimeride unites with unchanged monomer until a 32-membered chain of carbon atoms is formed. This then undergoes ring formation to form the symmetrical bromide of erythrene-caoutchouc.

### CONVERSION OF ISOPRENE AND B-MYRCENE INTO CAOUTCHOUC.

The discovery of the formation of B-myrcene in the process of conversion of isoprene into caoutchouc throws light on the mechanism of this process. In the first phase, the hydrogen atom and the residual radicle from a molecule of isoprene combine at the ethylenic linking of a second

molecule, giving the dimeride, B-myrcene. The latter is then converted into the trimeride, and so on, until the octameride is formed. This then undergoes "intramolecular polymerization" to isoprene-caoutchouc. This polymerization of chemically pure B-myrcene may possibly represent the only synthesis of natural caoutchouc, that is, of a substance perfectly identical with natural Para caoutchouc, both in the general structure of its nucleus and also in the positions of the methyl groups and double linkings of the molecule. There is reason to believe that tropical plants synthesize natural caoutchouc by way of B-myrcene or myrcene-like hydrocarbons or their dimerides and not by the polymerization of isoprene. The sap of plants frequently contains compounds with an atom grouping like that of myrcene, such as geraniol, linalool, nerol, etc., and dehydration of these unsaturated alcohols would lead immediately to the corresponding myrcenes.

### COMPARISON OF BRAZILIAN AND PLANTATION METHODS OF PREPARING PARA RUBBER.

G. Stafford Whitby recently reported the results of his researches on this topic before the London Section of the Society of Chemical Industry.

In order to obtain strictly comparable results, the two methods mentioned were applied to separate portions of the same lot of freshly tapped latex. The Brazilian method employed for the preparation of the fine hard Para rubber was followed as closely as possible, the latex being coagulated on a paddle in smoke from burning wood and palm nuts. The plantation method adopted as typical was the preparation of smoked sheet by diluting the latex, coagulating it with acetic acid (0.5 per cent of the weight of dry rubber), holding out the coagulum, drying the sheets, and finally, hanging them in a smoke house for 22 days. The products obtained by these two methods were subjected to precisely similar vulcanization tests, the results of which were expressed in accordance with a scheme worked out by P. Schidrowitz to indicate the duration of heating required for a "perfect" cure and the mechanical properties of the vulcanized product.

The results indicate that the Brazilian method is not superior to the plantation method, and the rubber coagulated by the Brazilian method required longer curing in the vulcanization tests. Such differences as were observed the author attributed in part to a specific and deleterious action of phenolic substances derived from the smoke, and the presence of formaldehyde may also be responsible to some extent.

From vulcanization tests on a very large number of samples, the author concluded that oxidation and the discoloration which it produces have no effect on the vulcanizing properties of the rubber. The outer and more discolored portions of balls of fine hard Para rubber were found to be equal in quality to the inner portions.

Separate investigation of rubber from young and from old trees gave no support to the widely accepted opinion that the latex from young trees is inferior.

In further experiments it was ascertained that air-dried plantation sheet rubber is quite equal, if not superior, in quality to smoked sheet rubber.

In the discussion following the paper Professor Henry E. Armstrong said that the impression he had formed when recently in Ceylon was that they understood very little of what they were doing, and that more research work was



necessary in regard to rubber than was being practiced at the present time.

Dr. Stevens said that for some years there had been research stations in Ceylon and Malaya. Rubber stations have been carrying out work for six or seven years past, and researches have also been carried out at the Imperial Institute and in private laboratories.

#### OXIDATION OF HEVEA RUBBER.

The experiments of M. Kerbosch on the oxidizability of rubber of *Hevea Brasiliensis* (Bulletin of Agricultural Intelligence, 1915, Vol. 6, page 1703) show that rubber under the influence of sunlight and of diffused daylight gave the following results: Rubber prepared by evaporation of the latex resists oxidation better than that prepared by coagulation. The difference is due to the presence in the former of certain unidentified soluble constituents of the latex. The oxidizability of the rubber is not affected by the presence of quebrachite. The superiority of the Brazilian method of coagulation is probably due chiefly to the retention of the soluble constituents mentioned, and not to the smoking operation.

#### NEW COAGULANTS FOR RUBBER LATEX.

HEVEA latex is readily coagulated when acidified. It is not desirable to accomplish this by permitting the latex to become rancid because of the important loss of uncoagulated rubber in the waste serum of the latex. In consequence, acetic acid has been generally adopted as the preferred coagulant in the preparation of plantation rubber.

Since the beginning of the war the price of acetic acid has risen from about ten cents to 60 cents per pound, and is almost unobtainable owing to lack of transportation facilities.

The serious shortage thus caused has resulted in a thorough search for a substitute for the very large quantity of acetic acid required on the rubber plantations throughout the Far East. Among the substitute reagents suggested but not generally adopted are sulphuric, hydrochloric, nitric, oxalic, tannic, carbolic, tartaric and citric acids, corrosive sublimate and acid potassium tartrate. Aside from the merits of these chemicals as coagulants, they are in scarcely better position than acetic acid as regards price and transportation to the plantations. Acetic acid can be made cheaply and in ample quantity from cocoanut shells. The crude product is not sufficiently clear in color for the coagulation of rubber that is to be made into first latex crêpe, but good, clear, smoked sheet can be and is being made in large quantities with it.

For the production of first latex crêpe a better substitute for glacial acetic acid is necessary. This has apparently been found. It is well known that in all parts of the tropics there are many strongly acid fruits, water extracts of the juices of which readily coagulate rubber latex. Shortly after the beginning of the war cocoanut water, and cocoanut vinegar were found to be suitable coagulants; especially cocoanut water, which is now being regularly used on some rubber estates. The process consists in allowing the cocoanut water to ferment for four or five days, after which it can be used immediately for coagulating latex. It is said to produce better rubber than that procured by using crude acetic acid, especially as regards color.

Ceylon is said to produce enough cocoanut shells to provide sufficient acetic acid for all the smoked sheet rubber made in Ceylon and perhaps in the whole East. At the same time the available supply of cocoanut water would doubtless practically supply the requirements for the production of first latex rubber, and the entire rearrangement become a profitable one both to growers of cocoanuts and of rubber.

#### PROPERTIES OF VULCANIZED RUBBER.

THE relationship of mechanical to chemical properties of vulcanized rubber has been studied by Philip Schidrowitz and H. D. Goldsbrough, who have published in the "India Rubber Journal" (April 8) notes on the preliminary results obtained. The experimental methods employed were as follows:

MIXING.—Standard mixing of 100 parts rubber and 8 parts sulphur.

CURING.—Standard cure, in screw molds, in live steam at 286 degrees F.

CORRECT CURE (Rate of cure).—This was determined by the optimum curve method ("Rubber Industry," 1914, page 212).

The examination of many hundreds of samples demonstrates that the optimum curve method of estimating the correct cure gives in practice concordant results, and actually represents the best product obtainable under the conditions of mixing, curing and testing.

SLOPE OF CURVE (Type).—As a matter of convenience the slope of curve is represented by the figure corresponding to the expression

$$T = \frac{E_1 - E}{2.5}$$

E = elongation at a load of 600 grams per square millimeter and  $E_1$  = that at a load of 1,040 grams per square millimeter. For any given load the extension will be greater for the flatter curve. This fact is of fundamental importance.

INSOLUBLE MATTER.—This was determined by difference [Schidrowitz, "Rubber" (Methuen, 1911), p. 252].

SOLUBLE MATTER.—Caspari's method, and his distinction between "soluble" and "pectous" rubber was observed.

COMBINED SULPHUR.—This was estimated in the rubber after exhaustive extraction with acetone.

Number.	Nature.	Correct Cure. (Hrs.)	Slope of Curve. (Type.)	Lbs. per Square Inch.	Elongation at Break. (Original = 1.)	Insoluble Matter.	Soluble Matter.	Combined Sulphur. (Per Cent.)
1—Smoked sheet...	2	38	2,118	X	10.39	10.80	81.9	4.37
2—Smoked sheet...	2½	33	2,250	X	10.74	8.88	81.3	4.86
3—Plain sheet....	2½	33	2,100	X	10.06	7.52	28.8	2.88
4—Plain sheet....	4	31	2,450	X	11.00	6.64	80.55	2.03
5—Smoked sheet...	1¾	36	2,100	X	10.43	11.52	81.1	4.30
6—Smoked sheet...	2	37	2,110	X	10.35	10.16	76.4	4.70
7—Film sheet....	2¼	37	2,528	X	10.56	7.52	94.85	4.21
8—Film sheet....	1¾	33	2,289	X	10.78	17.20	81.75	4.70
9—Pará .....	3	38	2,093	X	10.43	.....	.....	3.62

As far as they go, these results do not support the suggestion made by B. J. Eaton that the amount of combined sulphur at the correct rate of cure may be more or less a constant, like the mechanical properties. It should be noted that the two plain sheet samples, while not differing greatly as regards mechanical properties from the smoked sheet samples, both show a very much lower "combined" sulphur content.

#### LAYING OF THE CORNER STONE OF THE CHEMISTRY BUILDING OF THE BUREAU OF STANDARDS, WASHINGTON.

On March 23, the corner stone of the new chemistry building of the Bureau of Standards, at Washington, D. C., was laid by the Hon. William C. Redfield, Secretary of Commerce. The building is about 60 X 200 feet, constructed of brick and stone, and is to be four stories in height, in addition to attic and basement. It will provide adequate laboratory space for about 120 chemists, besides rooms for offices, supplies, etc. It will probably be ready for occupancy early in the spring of 1917.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

## CHEMICAL TREATMENT OF RUBBER.

## THE UNITED STATES.

**COATING COMPOSITION.** A new product, the oil of Pontianak rubber resin. [Carlton Ellis and Alfred A. Wells, Montclair, New Jersey. United States patent No. 1,179,413.]

## THE UNITED KINGDOM.

**SYNTHETIC CAOUTCHOUC.** Isoprene and synthetic caoutchouc substances are prepared by the following processes: (1) Treating with fuming sulphuric acid a mixture of an aliphatic ketone with an aliphatic alcohol or ether. Example, a mixture of acetone and ethyl alcohol or ether is treated, the reaction mixture is cooled and volatile products distilled off. (2) Passing ethylene or its homologues through a heated mixture of acetone or its homologues with fuming sulphuric acid, giving isoprene and caoutchouc. Propylene, butylene, or amylene and methylethylketone, diethylketone, dipropylketone, are also specified as parent materials. (3) Passing ethylene or its homologues, or the corresponding alcohol vapors, together with vaporized acetone or its homologues, through a red-hot tube, with or without a dehydrating agent, and collecting the reaction products in fuming sulphuric acid. [H. Stern, 42 Karlstrasse, Munich, Germany. British patent No. 297 (1915).]

## THE GERMAN EMPIRE.

**RUBBER SUBSTITUTE.** Sulphurized oils fluid at the ordinary temperature are treated with dilute nitric acid to obtain a product which can be vulcanized like rubber. It is not completely soluble in any known solvent, but swells up with carbon bisulphide, benzol, etc., to a gelatinous mass, which on evaporation of the solvent leaves a tough elastic residue which can be used for many purposes as a rubber substitute. [H. Bayer, Vienna, German patent No. 288,968 (1914).]

## THE FRENCH REPUBLIC.

**VULCANIZING RUBBER CEMENT BY ULTRA VIOLET RAYS.** The process consists in exposing thin layers of pure rubber, a fraction of a millimeter thick, to the action of ultra-violet rays from a mercury quartz lamp using 220 volts, 3 amperes of current. The surfaces to be united are held by mechanical means at a distance of 5 centimeters from the lamp. The exposure required is about 40 seconds. The vulcanizing agent may be free sulphur, metallic sulphides or metallic sulphides in the presence of bisulphide of carbon. Extremely dilute solutions of rubber are successfully used for cementing surfaces by this method because the surfaces freely absorb the solution and the vulcanizing effect of the ultra-violet rays converts the cementing medium into a strong elastic binder. [H. Olivier. French patent No. 477,204.]

## OTHER CHEMICAL PATENTS.

## UNITED KINGDOM.

- 140 (1915). Coating compositions. S. Graves, Lister Building, St. Louis, Mo.  
100,092 (1916). Lithopone. R. B. Llopert, 740 Santa Rosa street, Cordoba, Argentina, S. A.

## POROSITY IN RUBBER GOODS.

The porosity of rubber as it occurs in the manufacture of goods is due to one or more of several factors. Surface porosity is usually caused by condensation of steam on the goods during vulcanization. In the case of goods cured embedded in talc in open steam, drops of water sometimes percolate through the talc to the rubber and cause uneven vulcanization, by locally reducing the temperature. This danger may be practically eliminated by protecting the receptacle for the goods with a sheet metal covering to shed the water. In the case of wrapped goods, moistening the wrapper will prevent blowing. Internal porosity is caused by moisture in the rubber or compound, by the use of a low-grade, weak rubber in whole or in part, or by over-milling the stock in

breaking down the gum or compounding. Porosity in molded goods may be due to imperfect closure of the mold or to insufficient stock to fill the mold.

## LABORATORY APPARATUS.

## VISCOSITY INSTRUMENT.

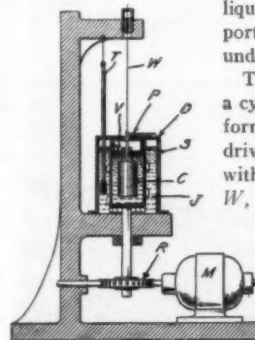
IN a paper presented by H. C. Hayes, professor of physics, and G. W. Lewis, assistant professor of engineering, both at Swarthmore College, at the spring meeting of the American Society of Mechanical Engineers held at New Orleans, Louisiana, last April a new form of viscosimeter was described. It operates in accordance with the principle that a solid body having a surface of

revolution when suspended in a rotating liquid experiences a torque which is proportional to the viscosity of the liquid under test, such as a lubricating oil.

The specimen, *S*, is contained within a cylindrical chamber that is rotated uniformly by a motor, *M*, through a worm drive, *R*. A cylinder, *C*, is suspended within the specimen by a thin steel wire, *W*, so that the axes of the rotating liquid and the cylinder coincide.

A cap, *V*, shaped so that the excess liquid can overflow when the cap is seated and thus give constant conditions within the specimen chamber, is provided. The specimen chamber is surrounded by an oil jacket, *J*, in which a thermometer, *T*, is suspended.

The jacket oil may be brought to any desired temperature by a heating coil. The cover of the jacket chamber, *D*, has a scale



THE VISCOSITY OF AN OIL IS HERE MEASURED BY THE TWIST GIVEN TO A BODY WHEN OIL CHAMBER IS REVOLVED.

graduated in degrees or may be calibrated to read the viscosity in terms of a standard liquid directly through the deflection of the pointer, *P*. The specimen chamber and the suspended cylinder are both made of copper to insure a constant temperature throughout the specimen, and the outside of the specimen chamber is provided with blades which keep the jacket oil thoroughly mixed as the chamber revolves and thus expose the latter to a uniform temperature. This is an important factor toward insuring constant temperature throughout the specimen.

Experimental work conducted with the machine has shown that the temperature of the specimen is uniform to within a small fraction of a degree and follows that of the jacket oil so closely that the temperature viscosity curve can be taken while the temperature is slowly raised or lowered. This has proved to be a great saving of time and labor, as it is not necessary for the operator to stand by the instrument continually. The deflection of the pointer is at any instant a measure of the viscosity, so that all that is required is to take simultaneous readings of temperature and deflection at intervals in the heating or cooling process.

## RESISTANCE GLASS.

The war has stimulated the production in America of resistance glass for chemical and other purposes. There are now on the market several excellent brands of this material, capable of filling the severest requirements. Among these may be mentioned the "Pyrex" laboratory glassware of the Corning Glass Works, Corning, New York; Fry resistance glass, H. C. Fry Glass Co., Rochester, Pennsylvania; "Vitreosil," Henry Heil Chemical Co., St. Louis, Missouri; Transparent quartz glass, Hanovia Chemical Manufacturing Co., Newark, New Jersey; "Nonsol" glass, Whittall-Tatum Co., New York City; "Insol" glass, Lenz & Naumann, Inc., New York City.

## The Commercial Production of Benzol.

Now that prices of solvents used in the rubber industry have greatly advanced, the following account of the manufacture of benzol is particularly timely and interesting. It is summarized from a comprehensive article by J. Albert Robinson, in the "Quarterly of the Natural Fire Protective Association." The illustrations are from plants erected by the H. Koppers Co., Pittsburgh, Pennsylvania.

**B**ENZOL recovery, from coal gas residuals of gas works and the by-product coke ovens, has become a great industry new to this country, on a scale of real commercial importance. The recovery of the valuable by-products, such as tar and other residuals, and the extraction from the gas itself of ammonia and benzol has proved a source of great revenue to the coal

the amount distilling at 212 degrees F. The lower boiling benzols have the following approximate composition:

BENZOLS.	100%	90%	50%
Benzene .....	94-97%	80-85%	40-50%
Toluene .....	2-6%	10-20%	30-60%
Xylene .....	0-1%	0-5%	0-25%

In general, the use of all grades of benzol has been for solvents. They are excellent solvents for gums, resins, greases, rubber, etc., and it is mainly upon the wide and varied solvent power of benzol that their commercial utilization has rested.

The present impetus has been given the industry for the production of explosives. Aniline oil and synthetic carbolic acid have been manufactured in this country in a small way for technical purposes.

It is thought that benzol will find a ready market as an automobile fuel after the war. Experiments for automobile purposes show that benzol has a motive power about 25 per cent better than gasolene; consequently it would have that advantage at the same price. With the present immense production of benzol, the cost has been reduced so that it could actually be produced



BATTERY OF 56 KOPPERS BY-PRODUCT COKE OVENS.

gas producer, and this business has become a very important agent for the conservation of a great natural resource.

Owing to the custom of candle power standard, instead of the scientific method of heat value standard, most of the benzol recovered at the present time is from by-product coke-oven gas.

### COAL TAR.

Coal tar is the oily mixture which separates from the gases formed in the destructive distillation of coal. The raw tar is composed of light oils, pyridine bases, phenols, naphthalene, anthracene, heavy oils, pitch; also materials insoluble in benzene, such as free carbon, water, ammonia and dissolved constituents of the gas. It varies greatly in composition, and may be divided into retort gas tar and oven gas tar.

**RETORT GAS TAR.**—The retort gas tar is obtained as a condensation product in the hydraulic mains, scrubbers or condensers in the manufacture of coal gas for illuminating purposes.

**OVEN GAS TAR.**—This material is obtained in the distillation of coal in retort or by-product coke ovens. It is similar to gas tar, but is more fluid. It contains more of the hydrocarbons, and considerably less free carbon.

One ton of good gas coal yields about 10,000 cubic feet of gas, 1,400 pounds of coke, and 120 pounds, or 20 gallons, of tar. Not over 2 per cent of this tar consists of benzol, while 2 gallons of benzol may be recovered from the gas given off from the same amount of coal. It is estimated that benzol is now being produced at the rate of 15,000,000 gallons a year in the large steel works alone, an amount five times greater than before the war.

Pure benzol, or benzene, has the formula  $C_6H_6$ . A similar product of the same formula is found in crude petroleum, and is known as benzine. The distinction in spelling should be noted.

Commercially, benzol is known as 50 per cent, 90 per cent and 100 per cent benzol, these consisting mainly of benzene and toluene, with small amounts of xylene. This percentage does not indicate the comparative purity of the materials, but merely



GAS SCRUBBERS FOR BENZOL EXTRACTION, KOPPERS' SYSTEM.

now, and sold at the same price as gasolene if it were necessary to do so. The use of gasolene for automobile fuel is so large (100,000,000 gallons per year) that it is with difficulty that the oil companies are able to produce enough to meet the demand.

### METHODS OF RECOVERY OF BENZOL.

The recovery of benzol, etc., from gas is carried out in two principal steps: Scrubbing or washing, and extracting or recovering.



After the gas has been cooled to the required temperature, it is admitted into the benzol washers, where it is brought into intimate contact with wash oils which at low temperatures are capable of dissolving out of the gas all the constituents, which go to make up what is commercially known as crude or 50 per cent benzol. The wash oil containing the benzol will again release these constituents after being heated to about 266 degrees F., and further separation takes place by distillation.

**SCRUBBING OR WASHING.**—The wash oil, called "straw oil" at the works, is a petroleum product which is virtually a light machine oil, free from water, having a low naphthalene content, and a flash point of 300 degrees F., or more. The gas is passed



BENZOL STILL.

through one or more water tanks, then through several scrubbers, consisting of tall iron towers, through which the gas passes upward and encounters a downflow of straw oil. The oil may be sprayed, or spread out over the hurdles or trays contained in the towers. By thorough scrubbing it is possible to remove practically all of the benzol, etc., from the gas.

The scrubbed gas is passed through a drip tank, and then sent to the gas manufacturing division of the works to be burned under the ovens, sent to gas enriching plant or direct to gas holders. The saturated wash oil, or "charged oil," is delivered to near-by storage tanks, from which it is pumped to a storage tank on the roof of still house at the recovery plant.

**EXTRACTING OR RECOVERY.**—The processes in this plant are essentially the heating of the wash oil to drive off the absorbed benzol constituents, the recovery and cooling of the wash oil, and the separation by distillation of these benzol constituents to a greater or less degree. There may or may not be present an elaborate rectification plant for recovering benzol of 90 per cent or more purity. In the ordinary separation of a light oil, or primary oil, 80 per cent benzol may be attained, and the secondary or heavy oil will contain toluol, xylol, etc. These oils may be shipped away for further refining at the plant where they are to be used.

The detailed methods of recovery vary, and an exact account of any one plant would not apply to all. The process is rather involved, but the fundamental features are about as follows:

In order to use as small an amount of steam as possible for heating the charged oil, methods of preheating are used. The cold wash oil enters a preheater, where it is heated to about 175 degrees F., by benzol and steam vapors issuing from the still. This oil now passes through a second preheater in which it is preheated to a temperature of about 212 degrees F., by means of the hot debenzolized wash oil issuing from the still. The lighter products of benzol begin to vaporize and leave the oil. It is then heated to about 266 degrees F., by means of live steam in one of the superheaters, for the purpose of driving off the water contained in it and thus rendering it possible to separate the naphthalene. The naphthalene is washed from the gas

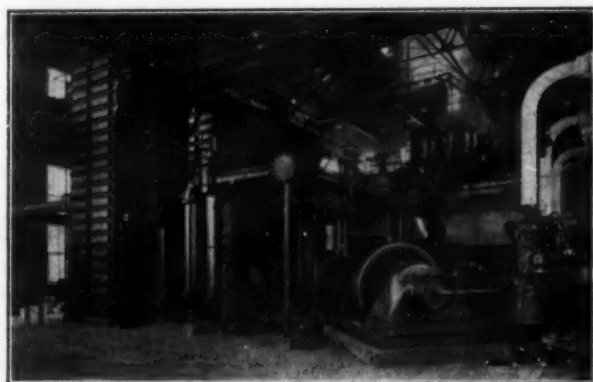
and absorbed by the oil in a manner similar to washing out benzol in the scrubbers.

At the temperature of 266 degrees F., in the superheater, all benzol, toluol and water is expelled, and the oil with its remaining burden, xylol, solvent naphtha and naphthalene, now enters the still. The oil flows through the lower portion of this apparatus, the steam being blown directly into the lowest part of the still, thence traveling in a direction counter to that of the oil, thus driving off all xylol, solvent naphtha, and most of the naphthalene from the wash oil.

The resultant mixture of benzol and water vapors passes through the upper portion of the still, where crude rectification is performed and where all entrained wash oil particles are separated from the vapors. The benzol and water vapors issuing from the superheater enter the upper portion of the still, where they are rectified in conjunction with the other vapors.

These vapors now issue from the top of the still at a temperature of about 220 degrees F., and enter the first superheater, previously mentioned, where they are nearly all condensed and the wash oil receives a preliminary heating. The remaining vapors and the condensates formed in the superheater then enter a water cooler, where the vapors are completely condensed and all condensates, water and light oils, enter a separator or decanter, where they are separated due to their difference in specific gravity.

The wash oil, which has been freed from benzol, etc., leaves the still at a temperature of about 257 degrees F., and enters the superheater previously referred to, where it transfers a portion of its heat to the charged wash oil, after which it enters the oil cooler, where it is cooled by water to a temperature below 77 degrees F. It may pass over a series of circulation coils through which cold water is passing, arranged one above the other ver-



GAS WASHERS, TAR EXTRACTORS AND GAS EXHAUSTERS.

The rectangular stacks on the left are bell washers for removing ammonia from the gas. The elevated tanks are for liquor storage and feed.

tically; the oil flows down over the whole coil, being caught in a trough at the bottom.

A further distillation may take place and the various benzol products be separated and sent to their respective storage tanks. Purification of benzol, etc., is accomplished by washing with sulphuric acid, caustic soda, and washing and then distilling, for a final separation of the products, in their desired state of purity. This is generally done, where necessary, at the plant using these materials. From the usual by-product coke oven gases, about the following proportions of hydrocarbons are recovered: Benzol 67 per cent, toluol 16 per cent, xylol 8 per cent, and solvent naphtha 9 per cent.

The United States Geological Survey reports 14,000,000 gallons benzol and other light oils produced in the United States in 1915. In connection with these oils 761,256 pounds

of naphthalene were recovered. Several of the plants are not equipped to separate the different oils found in the crude. Over one-half the output, 7,322,670 gallons crude benzol and light oils, were shipped in tank cars to refineries connected with powder works and other chemical industries; 6,620,090 gallons of crude oils refined at the place of recovery yielded 483,393 gallons of 100 per cent benzol; 1,315,727 gallons of toluol, and 470,425 gallons of solvent naphtha.

Thirty-one coke making establishments with 4,933 by-product ovens contributed to this total, and it is estimated that between eight and nine million tons of coal were carbonized. The annual capacity of the benzol recovery plants



BENZOL PURIFYING APPARATUS.

now in operation is estimated at over 20,000,000 gallons and with the completion of the plants now building will probably exceed 22,000,000 gallons.

#### DEMOUNTABLE RIM HISTORY.

TO the Editor of THE INDIA RUBBER WORLD:

You have recorded some very interesting history in your May issue, in your story of "Perlman Wins the Demountable Rim Suit." Notwithstanding my present close connection with rim circles, I am not rimpled when I write to register a slight correction in the interest of history. History, it has been well said, is a systematic record of past events, especially the record of events in which man has taken part.

In your opening paragraph you say, that "the first public use of this invention (demountable rim) was in June, 1905, when Thery substituted a new tire for a damaged one in 80 seconds, an unprecedented feat." Conceding for the moment, for the purpose of argument only, that this is true, let us seek its origin and source, for this statement was evidently taken from "La France Automobile" of the issue of June 29, 1905, concerning the Richard-Brasier cars driven in the James Gordon Bennett Cup Race in France, by Thery and Caillois, on July 5, 1905, six days later, so that the French motoring magazine actually published this feat before it really occurred.

Looking over the files of all of the foreign and American publications of June and July, 1905, at which time I was editor of "Motor," handling all its technical and editorial matter, I failed to find a single mention paralleling this statement made in "La France Automobile," but I did find mention of the fact everywhere, that clincher tires of Michelin make with a leather band and metal studs were used, and all the photographs of the Richard-Brasier cars used in that race show these tires and plain clincher rims, and Michelin himself advertised this fact in the English and French motoring journals. So, if I am correct in this chronological statement, then I may well say "that youth

longs, and manhood strives, but age remembers," and "La France Automobile" was wrong.

Now, except for the fact that you might think that as a press agent I might be guilty of that charming faculty that members of the Fourth Estate have, i. e., unconscious exaggeration, let me quote from Judge Hunt's decision, who heard the testimony in open court and was, therefore, best able to judge of the truth of the matter as to when a demountable rim of the Perlman type was first publicly used. Judge Hunt says, "invention which was completed by Perlman in the summer of 1903, and which under the evidence must be found, was first publicly used by Perlman on a Royal car in August, 1904." Again, Judge Hunt says, "The French patent to Vinet, November 4, 1904, was considered by the patent office examiner. Perlman made a showing sufficient to overcome the Vinet reference, and thereafter the examiner in the patent office abandoned Vinet. Perlman showed prior invention." Further on, Judge Hunt says that, as he "understood it, Vinet showed a complete ring, not crosscut or split, and failed to show a ring capable of radial movement." Finally, Judge Hunt said that, "in October, 1904, he (Perlman) put his wheels on a Welch car and used it. A number of witnesses say that they went riding in the summer and the fall of 1904 with Mr. Perlman. One witness particularly recorded that he went with Perlman in the Welch car to attend the first Vanderbilt Cup Race, the date of which was 1904."

In the United States Circuit Court of Appeals, the element of time was the only point considered. Judge Lacombe, who wrote the decision of the Court of Appeals, said, "The crucial question here is the date when Perlman reduced to practice the invention which he describes in his patent. The trial court found that the evidence showed beyond a reasonable doubt that the invention was conceived in 1903, and actually put to use on a car in 1904."

"Judge Hunt heard the witnesses for the case, which was tried in the above court. Under these circumstances, if we were in doubt, . . . we should hesitate to disturb the findings of the district court; but from an examination of the testimony, as it is here presented in cold type, we are convinced as Judge Hunt was, . . . but when we have the demountable wheel used in 1904 before us, . . . all doubts as to what Perlman's original invention was are resolved." Finally, Judge Lacombe said, that "we fully concur in Judge Hunt's reasoning and conclusions."

The Court of Appeals has the last say on this matter, and so we must accept their conclusions, and not the mere unsupported statement of a foreign motoring publication as to the first public use of a demountable rim of the Perlman type.

During the past 35 years, it has been my very good fortune, indeed, to be closely associated with many very famous patent cases, notably so, the Lallement bicycle crank; the Fauber one-piece bicycle hanger crank; the Conrad ball bearing, and the Perlman demountable rim, but none of these have exceeded in public utility, in value and general use the Perlman demountable rim, and if I may paraphrase Dr. Mayo,—Perlman displayed that type of originality which we call genius, to which discoveries marking epochs are due, but which is given to but few men. The type of which Perlman was a distinguished example, while, perhaps, not arising to a height to be called genius, has been given to many men. The latter phase of originality may best be characterized as scientific imagination, carrying with it a talent for work,—scientific imagination, reasoning from things known to unknown, clarifying and solving problems by what may appear at first to be merely an hypothesis, a leap in the dark, but which is soon to have sound footing in fact.

Everybody knows that a wheel is old, a rim is old and may be moved off and on a wheel, and a wedge is old, but Perlman's idea of connecting these three essential elements together and adding to them the necessary operating parts, made a new combination previously unknown to engineers, and produced a valuable result, i. e., the demountable rim of today.

Yours very truly, ALEX. SCHWALBACH.

## Welding Rims by Electricity.

By C. D. Ryder.\*

**I**N the older days of rim manufacture the processes used were more or less crude as compared to present day methods. This is a general statement that may be applied equally well to many industries, and the manufacture of automobile rims is no exception to the rule. Inasmuch as this article is supposed to deal chiefly with the process of welding rims rather than to convey a great deal of information regarding the whole process of manufacture, the writer will try to give a clear idea of this work, the result of observations made in a number of the larger plants, and of experience covering several years' intimate connection with the electrical welding process.

The old original, time-honored method of welding iron or steel involved taking the articles to be welded to the blacksmith shop,

just here it may be of interest to explain, briefly, what an electric welder is, how it operates and the kind of welds it produces.

Fundamentally, the electric welder depends for its operation upon a well-known law which states that if an electric current is caused to pass through a substance (such as iron or steel) a certain amount of heat will be developed in the substance traversed by the current which will be proportional to the square of the current, the resistance the substance offers to the flow of current, and to the time the current is applied. The final temperature attained by the substance will depend upon the readiness with which this heat is dissipated by radiation and conduction. An electric welder, then, is a machine for securely clamping the parts to be welded in proper alignment, with means for passing a heavy electric current through the abutting ends of metal and with provision for forcing these two ends together to complete the welding operation. The commercial machine is one which not only embodies these three essential features but, in addition, is equipped with means for adjusting the current through a given range of values, to suit the stock to be welded, switching mechanism for applying and turning off the current, and numerous adjustments which are obviously necessary.

Little or no preparation of the stock is required for performing an electric weld. All that is necessary is to have the surfaces fairly clean, to insure good electrical contact of the material in the copper dies or electrodes. No scarfing of the ends is done. The heat is developed at the junction of the abutting ends only. When the correct welding temperature is reached, the current is turned off and the ends are forced together by the action of a lever or an hydraulic ram. In the process of forcing the ends together the burnt and oxidized metal is extruded from the weld in the form of a fin, which is quite thin and is easily removed. As all

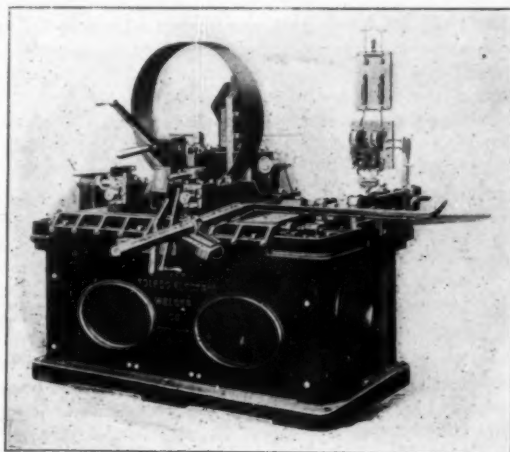


FIG. 1.—17A ELECTRIC WELDER.

which was a distinct and important department in every well regulated factory. The pieces to be welded having been delivered to his "sanctum," the blacksmith proceeded to heat the ends and scarf them down by hammering. He then placed the ends again in the fire, sprinkling a little borax and sand over them to reduce oxidation, and brought them up to the welding heat. Upon attaining the correct temperature, the pieces were withdrawn, the ends overlapped, as provided by the scarf, and the joint hammered to force the two ends of metal together forming a weld. The hammering was continued until the metal at the joint was reduced to about the same dimensions as the original stock. Obviously this method was slow and productive of uncertain results. The strength of a weld made in this way depended altogether on the skill of the blacksmith. It may be said that no matter how skilful the blacksmith or how carefully the joint was made, it could not by any possibility approach very closely the strength of the original stock. The chief reason for this lay in the fact that more or less oxidation takes place in spite of the flux used, which was retained in the weld at the junction of the pieces.

However crude and unsatisfactory the old method may have been, it was the only one which could be used until the advent of the electric welding machine. As a matter of fact, it may be conservatively stated that the electric welding machine has made possible the successful production of automobile wheel rims on a commercial scale. Electric welding is now done, exclusively, in every rim plant in the United States, so far as the writer knows.

\*Electrical Engineer, The Toledo Electric Welder Co., Cincinnati, Ohio.

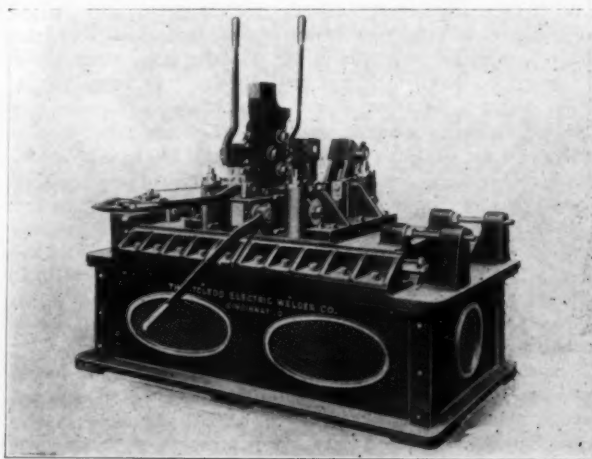


FIG. 2.—15A ELECTRIC WELDER.

the burnt or oxidized metal is thus extruded, leaving only clean metal which has not been touched by the air in final contact, no flux is required and the joint is of maximum strength. Tests made to determine the strength of a weld made in this manner indicate that usually, barring carelessness, the welded portion will show the same strength as any other portion of the stock of like sectional area.

Various methods are employed in the different large plants in the manufacture of automobile rims, but the following



brief outline is typical of them all. The stock (either rectangular in cross section or of some special shape) is first cut to the proper length corresponding to the circumference of the rim. It is then formed up into a circle by rolling. The surfaces near the ends are slightly ground or sand blasted to remove the rust and scale to assure good contact in the welding dies. The rim is then placed in the welder for a period of from a few seconds to a minute and a half, depending upon the size of rim, which is the time required for making the weld. After welding, the rim is removed from the welder and the fin removed while red hot, by means of an air chisel, or it is sheared off in a special machine. Next, the welded portion is smoothed down by grinding and the rim brought to exact size by a special hydraulic shrinking machine or if under size, the rim is expanded upon a bulldozer. The subsequent operations necessary to finish the rim for mounting are not of interest in connection with this subject.

It is estimated that approximately 75 per cent of the power taken from the lines is converted into heat and used directly in making the weld. The efficiency of the charcoal, coke, gas or oil fire in no way is comparable to this. Further, the use of the electric method vastly increases the output obtainable over the old method when employing a given number of men. And, moreover, the ends are held in absolute alignment and uniform results always assured.

The following table will give an idea of the current consumed and time taken in making welds by the electric process. In this table the time taken can be reduced by increasing the power, or *vice versa*.

Area Square Inches	Power Kilowatts	Time Seconds	Power Horse-power
1.00	18.75	40	25.0
1.50	29.5	44	39.5
2.00	33.0	57	44.0
3.00	43.5	70	58.5
4.00	56.3	80	76.0
5.00	61.7	90	83.0
6.00	69.0	98	92.5

While there are several machines used for electrical rim welding that are designed to perform a great variety of work, the illustrations and descriptions are of typical rim machines.

The welder shown in Figure 1, welds flat stock up to 6 x ¼ inches, or 1 x ¼ inches, or 1½ inch round stock. This machine is designed for welding automobile rims, which are rolled to size and welded flat. The flat bands are then shaped in special rolls to fit the rubber tires. An exceedingly fine adjustment is obtained in the clamping dies by four eccentrics mounted in the heads and operated by worm gears. After the stock is clamped in the jaws, two levers mounted on cams give the final pressure to avoid the possibility of the stock slipping in the dies. On ordinary stock, 4 inches wide by 9/64 inch thick, a man will weld from 450 to 600 rims per day; 6 x ¼ inches, 350 to 400 per day, and 3¼ x ¼ inches, 600 to 700 per day.

The machine shown in Figure 2 welds rims up to 12 inches wide by ½ inch thick. It requires a heavy and well constructed machine, both mechanically and electrically, to heat and compress a piece of steel 6 square inches in cross section. This type is designed for welding this heavy stock and all parts are necessarily massive and substantially made. It is especially constructed for welding heavy flat band stock.

The Society of Automobile Engineers has issued a sheet showing to what extent the various automobile manufacturing companies are using S. A. E. standards in their manufacture. An examination of this sheet shows that 27 manufacturers of solid tires and 24 manufacturers of pneumatic tires have adopted these standards, while in insulated requirements 12 are using these standards, and 9 have adopted the standard tests of insulating materials.

#### BRITISH SOLID TIRE RIM STANDARDS AND AMERICAN SIZES.

OUR British contemporary, "Motor Traction," has of late devoted space to a controversy relating to the advisability of prohibiting or, at least, placing a heavy duty upon, the importation of American commercial motor vehicles not conforming to British tire standards.

The British Finance Act, 1915, placed 33½ per cent duty upon imports of motor cars, chassis, motorcycles and parts and accessories of motor cars and motorcycles, except tires. Commercial cars were, however, excepted from the operation of the tax and were also left without mention in a recent royal proclamation prohibiting the importation into Great Britain of pleasure cars and accessories (except tires).

The controversy above referred to was started by an open letter to our contemporary in which it was argued that the importation of American motor trucks, not conforming with British standard tire sizes, would introduce an element of disorganization into the British trade, as there would necessarily be a demand for various American tire sizes for at least 5 or 6 years after they had been placed in service. It was pointed out that after the mutual agreement that had been made between British automobile manufacturers and tire manufacturers, it would be regrettable that American importations should upset all calculations and necessitate different molds, and consequent disorganization, not to mention increased expense in the production of solid tires. It was further stated that for American sizes, British tire manufacturers would be at a disadvantage when competing with American manufacturers. It was, therefore, proposed that a duty of 33½ per cent be levied upon American motor trucks (the same as was levied on pleasure cars before their importation was prohibited altogether), unless they conform to the British standards in construction and equipment.

The matter was taken up by other readers of "Motor Traction," one of whom went so far as to propose that combined pressure be brought to bear to induce the government to absolutely prohibit the importation into Great Britain, her dominions and colonies, of trucks which do not, so far as as their wheels are concerned, comply with British standard sizes. British tire manufacturers had been put to great trouble in competing for the business in furnishing odd size tires for trucks which were already in use in England. It could not be expected that users would go to the expense of altering wheels to accommodate British standard tires, and, either the tire manufacturer would have to stand this expense, or continue to produce tires from molds of suitable American sizes.

A correspondent presenting the other side of the case—there are always two sides—pointed out the advantage to the commercial community which had resulted from the free importation of American trucks at a time when British manufacturers were unable to guarantee deliveries and the fact that an examination of American wheel and tire sizes showed that there were only six of these, three of which had been adopted by the American Society of Automobile Engineers as standards. The manufacture of the three or six American sizes was quite a different matter from the manufacture of the multiplicity of millimeter sizes which was taking place in Great Britain prior to the adoption of the British standards. All these old millimeter sizes promise to be wiped out in the course of the next five or six years, as soon as the vehicles become obsolete. The matter is receiving the earnest consideration of British, American, French, Italian and Belgian manufacturers of both tires and automobiles, and there is promise of an international agreement on the subject. Such an agreement would be made difficult should ill feeling be raised by premature action.

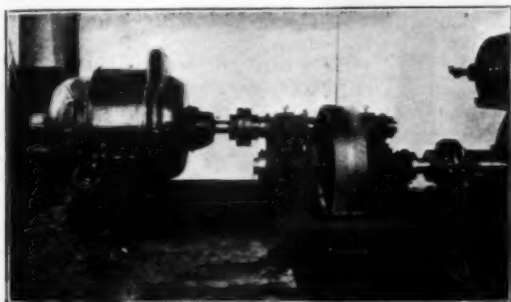
Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

## New Machines and Appliances.

### THE THROPP REDUCTION GEAR DRIVE.

**M**OTOR drives are becoming an indispensable aid to the operation of modern rubber mills where efficiency is recognized as one of the main factors of increased production.

Thropp has designed a new 100-horse power drive that is shown equipped with a special General Electric motor of the ventilating type. This is entirely enclosed and provided with an outside air suction vent and discharge pipe. Both motor and drive are bolted to a heavy continuous bed plate, the motor being connected to the jack shaft of the drive by a flexible coupling that allows the motor shaft to oscillate and the double helical gears to float. The jack shaft pinion is machine cut from a solid forging and drives the large cast iron main gear, both of which are the "Maag," double helical cut type of gearing. They are enclosed in oil-tight guards and run in a bath of oil, the bearings being of the newest

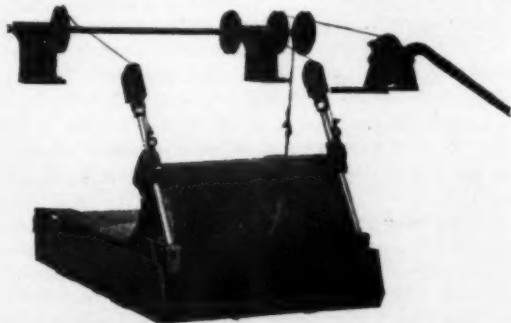


ring oiling type. The main driving shaft runs 100 revolutions and the jack shaft at 575 revolutions per minute. The drive is shown connected to a 2-roll rubber mill. [William R. Thropp & Sons Co., Trenton, New Jersey.]

### A NEW APRON FEED FOR MIXERS.

The value of a practical mixing apron is instantly recognized by progressive rubber men, particularly those who have had experience with the ordinary apronless mill. Two illustrations are given here of a device of this character that has recently attracted favorable comment. The first is a front view of the mechanism, ready to be attached to a mixer, while a rear view of the apron is given in the second illustration.

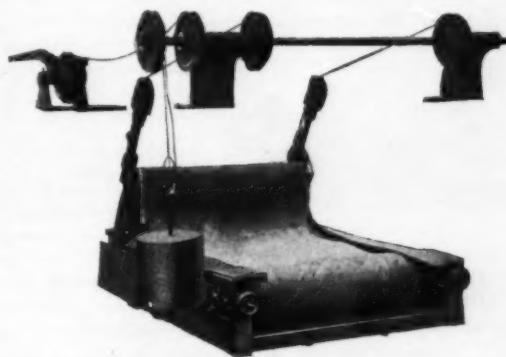
This device consists of a cast iron pan upon which are



fastened bearings and brackets supporting two rolls and also a sliding mechanism carrying a third roll. The apron, in the form of an endless belt, travels over these rolls and is driven by the top roll through direct contact with the front roll of

the mill. The batch is fed to the mill in the usual manner; the apron, however, catches the particles that have not massed and automatically returns them to the rolls.

The sliding mechanism makes it possible to drop the top roll so that the finished batch is easily removed, after which



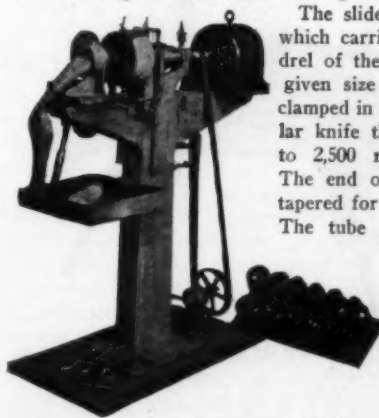
the roll is again placed in the original position and the mill is ready for another batch.

Among the advantages claimed for this mixing apron, safety comes first, for it reduces the possibility of injury to the workman. It eliminates the dust, so troublesome and expensive in ordinary mixing operations, and, moreover, delivers a finished batch of the same weight as the original amount placed in the mill. The saving of 30 to 35 per cent of the time consumed in mixing is another important feature and at the same time the material is delivered in a thoroughly massed condition. [Morgan & Wright, Detroit Rubber Works, Detroit, Michigan.]

### THE ALLEN TUBE SKIVING MACHINE WITH MOTOR DRIVE.

An extremely well designed, self contained, inner tube skiving machine is herewith illustrated, showing the consistent progress that is being made in labor saving tube building machinery.

The slide is operated by a lever which carries a hollow brass mandrel of the correct diameter for a given size tube. This mandrel is clamped in alignment with the tubular knife that revolves from 2,000 to 2,500 revolutions per minute. The end of the brass mandrel is tapered for a given length of skive. The tube is then thrust through the center of the mandrel and folded back over the tapered end. The slide is then forced forward by the lever until it comes in contact with the revolving knife and a sufficient flow of water is automatically released at the time of contact which is also automatically shut off when the slide is brought back to its original position. This feature prevents undue waste of water besides being cleaner, as the excess of water would become sloppy and objectionable. Also the little shutter device over the knife, which operates automatically, prevents the hands of the operator from coming in contact with the knife when placing the end of the tube in position. The



pedestal of the machine also acts as a reservoir for the water which the pump forces to the knife and back again through the splash pan into the pedestal.

The machine is equipped with six knives and mandrels for skiving all sizes of tubes up to and including  $5\frac{1}{2}$  inch. It is also furnished with drive with countershaft or direct connection to any motor that the customer may desire. [Allen Machine Co., Erie, Pennsylvania.]

#### ROLLS FOR REMOVING WRINKLES FROM FABRICS.

The twin screw rolls illustrated herewith are designed as an attachment for calenders, spreaders, bias cutters, brushing, rolling and measuring machines, for the purpose of removing wrinkles, puckers and turned edges from the goods. This device is particularly useful in connection with a rolling machine for taking out wrinkles from the liners and wrappers used in tire and footwear manufacture.

The rolls are cut with right and left-hand threads running from the center towards each end, and are mounted in stands so that they may be turned in any desired position and give as much contact of the cloth as desired on each of the screw rolls. The screw rolls may be adjusted to act on goods running horizontally, vertically, or at any angle. One screw roll acts on one side of the goods and the other screw roll on the opposite side to straighten out the selvages, no matter whether they are inclined to turn over toward the face or the back of the goods. Only one belt is necessary for driving both rolls. The rolls are regularly made of iron, though on special work where there is liability of rust they may be made of brass or other material. [Curtis & Marble Machine Co., Worcester, Massachusetts.]

#### MILLER'S BIAS FABRIC CUTTER FOR REPAIRMEN.

This is a very useful little machine for repair shops where a considerable volume of work is done. It is operated by a hand crank, or a power attachment can be applied if so desired. As the fabric is taken from the roll, the liner is automatically wound



up on a roller. The machine being set for the required width, the fabric is fed between the knives and by pressing down the foot lever a strip is accurately cut off on the bias.

The machine is useful in the manufacture of tires, reliners, flaps, boots and air-bags and will cut from 20 to 30 strips of fabric per minute. [Charles E. Miller, Anderson, Indiana.]

#### GAS BURNERS FOR VULCANIZING AND HEATING.

The use of illuminating gas as a heating medium for hard rubber vulcanizing presses is apparently being accepted as good practice by manufacturers of certain kinds of hard rubber goods.

A type of burner that is specially designed for this purpose would therefore be of interest to show the development of gas heat as a vulcanizing agent.

The burner shown in the illustration is of the three-burner type, arranged to be inserted in the chambered press platen through holes drilled in the side for that purpose. A flexible rubber hose that allows for the platen movement connects the header with the gas and air pipes that are fitted with lever valves by which the supply of gas and air is regulated. The number of these burner units usually corresponds to the number of platens in the press and the degrees of heat required. Single burners are furnished for direct mold heating, in fact all sizes are made to suit the quality of gas used and the special purpose for which the burner is intended.



The other illustration shows a powerful burner specially designed for industrial and laboratory purposes. This particular type of burner is used for heating metal furnaces such as are used in melting type metal, for casting soft metal molds. It is easily adapted as an atmospheric burner if so desired, or it can be arranged to work under air and gas pressure. The burner is made to deliver the required number of heat units in accordance with the work to be performed, and the correct adjustment for the varying quality of gas is also insured. [Tirrill Gas Machine Lighting Co., New York City.]

#### THE ADVANCE WASHER CUTTER.

A hand-operated machine that will accurately and quickly cut washers from sheet rubber, leather or asbestos would apparently fill a long-felt want in the repair shop or garage.



A press of the description shown here is made of cast iron and the crankshaft and plunger head are of cold rolled steel. The dies are made of tempered tool steel and turned down at the cutting end to a sharp uniform edge. There are 23 dies in the combination, which will cut 529 different sizes of washers ranging from  $\frac{3}{4}$  inch to  $3\frac{3}{4}$  inch outside diameter and any size inside diameter within this range. A maple wood cutting block also constitutes a part of the outfit. [Advance Felt Specialty & Cutting Co., Chicago, Illinois.]

#### VANADIUM STEEL RUBBER SHEARS.

For heavy work in cutting rubber, special shears have been designed, shaped to the hand of the operator, to allow continual use without tiring the wrist. A special feature is the automatic tension, which consists of a coiled spring made of piano wire, sunk in a hollow thimble between the blades. It is entirely out of sight, but with its upward tension it takes up the wear of the screw, keeps the blades in perfect adjustment and doubles the life of the shears. These shears are made of vanadium steel of extra hard temper, specially adapted to the heavy work required of them. [Perfection Shear Co., North Woodbury, Connecticut.]



## New Tire Machines.

### MOLDING PNEUMATIC TIRES.

THE object of this machine is to compress the tread mold against the tire core and draw the adjacent sides of the casing toward the beads. The side molds compress the casing adjacent to the beads against the tire core and the edges are stretched from the tread and inwardly toward each other. Thus the fabric plies are stretched, smoothing down all wrinkles and uneven surfaces.

The illustration on the left shows a vertical section of this machine in operative position. Base *A* supports the upper cross head by heavy upright rods. The table supports the core *D* and sectional tread mold *E* and normally rests on brackets *F*.

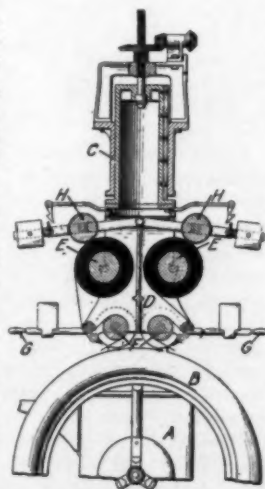
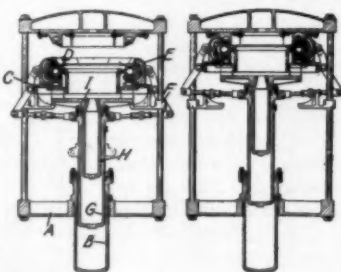
The tire core is placed in the machine and pressure applied to the ram *G* which acts on the levers, forcing the tread mold against the tire. Then pressure is applied to the inner ram *H*, bringing the table *I* in contact with the lower mold, when both tables *C* and *I* are simultaneously raised, forcing the tire against the upper mold by contact with the cross head as seen in the figure on the right. The pressure from both cylinders is then released and tire and core are removed for final curing. [Joseph H. Coffey, Jr., and Joseph H. Coffey, Toronto, Canada, assignors of one-half to Gutta Percha & Rubber, Limited, Toronto, Canada. United States patent No. 1,179,898.]

### THROPP'S TIRE BUILDING MACHINE.

This apparatus is particularly adapted for use in connection with the tire making machine covered in United States patent No. 1,119,326, granted to the same inventors, illustrated and described in the January, 1915, issue of THE INDIA RUBBER WORLD.

In the illustration, frame *A* supports the revolving tire core *B* upon which the fabric strips are applied. Frame *D* is attached to the cylinder *C* that is adjusted vertically by screw and bevel gearing. Two stock rolls *E, E*, that are journaled in this frame, carry the friction fabric of different widths used in constructing the casing. The wooden rollers *F*, guide the fabric to the revolving core, and tension is applied by weight levers *G, G*. The liner strips are wound up on the weighted rollers *H, H*, which are driven by contact with the stock rolls.

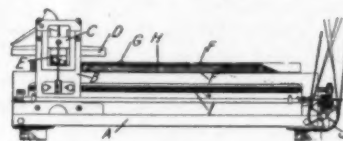
In operation the plies of narrow fabric are first laid on the core and then the bead cores are applied, after which the wider fabric is laid on while the core is revolved in the reverse direction. Thus the threads of the fabric plies under the bead cores are laid at the same angles and those of the superposed plies are laid the same, but at a different angle to the plies under the bead



cores. [Peter D. Thropp, John E. Thropp, Trenton, New Jersey, and Albert de Laski, Weehawken, New Jersey, assignors to The De Laski & Thropp Circular Woven Tire Co., Trenton, New Jersey. United States patent No. 1,178,874.]

### INNER TUBE ROLLING MACHINE.

In the manufacture of inner tubes, and for that matter hose generally, sheets of vulcanized rubber are rolled around a hollow mandrel, an operation requiring careful and experienced hand labor. A machine for doing this work is the subject of the following illustrated description.

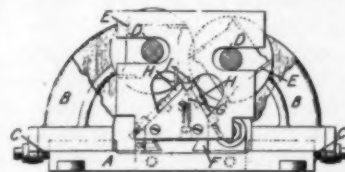


Referring to the drawing, which is an elevation of one side of the machine *A*, parallel housings *B* are provided with vertically sliding heads *C* connected to the mandrel rolling plate *D*. The vertical movement of this pressure plate is controlled by rollers *E*, sliding over upper and lower tread flanges *F, F*.

The mandrel *G* and sheet of rubber stock are placed on the table *H* and the screw threaded shafts *I* set in motion by the belt driven gearing *J*, moving the pressure plate over the table in contact with the mandrel, thereby rolling the sheet of stock around it. The mandrel and tube are then placed in a similar machine which performs the operation of cross wrapping in a like manner. [Elmer S. Current, Beach City, Ohio. United States patent No. 1,179,077.]

### TIRE BEAD TRIMMING MACHINE.

Molded beads are substantially triangular in cross section and the excess material on two of the edges known as "flash" must be trimmed off to make them serviceable. This is usually performed by hand, an operation that is comparatively slow and one that is not always productive of uniform results.



End Elevation

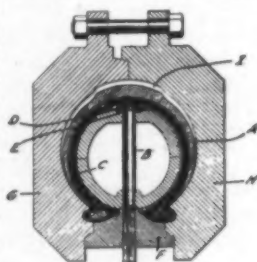
Midgley's machine provides a base *A* on which are mounted two pairs of curved brackets *B*, adjustable to and from each other by set screws *C*, and supporting two shafts *D, D*, each of which carries four curved cutter blades *E, E*. The bead guide block *F*, adjustable longitudinally, is triangular in cross-section and supports the trough-like bead support *G*. Stationary cutters *H, H*, vertically adjustable, are attached to the inclined sides of the guide block and a bar *I* restricts the bead to longitudinal movement.

In operation the cutter blades rotate toward each other with a downward cut and exert a shearing action, in connection with the stationary blades, on the bead as it passes through the machine, removing the "flash" in an effective manner. [Thomas Midgley, Detroit, Michigan, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,180,309.]

### METHOD AND APPLIANCES FOR BUILDING TIRE CASINGS.

The principal feature in this invention consists in subjecting the outer casing to an internal fluid pressure during vulcanization. Another is an improved form of collapsible core, is illustrated herewith, that does not require sealing at the joints.

Referring to the drawing, *A* is the collapsible core, *B* the valve stems and *C* the fluid-tight tubular casing of rubberized fabric that is placed over the core and provided with openings for the valve stems. At the outer end of each valve stem the tubular casing is held between two circular washers *D* and *E*. The sectional retaining ring *F* is provided with openings for the valves, and when the two mold halves *H* and *G* are bolted together a space *I* is left between the casing and the inner surface of the mold.



When the fluid pressure is applied through the valve stems the steam or hot water is discharged between the inner surface of the tire and the fluid-tight tubular casing surrounding the core. Thus the continued pressure forces the tire against the inner mold surfaces during the period of vulcanization. [W. R. Denman, assignor to Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,176,885.]

**REINFORCING INNER TUBES.** A tube is placed in a flattened condition around an endless circular form and a strip consisting of fabric on the outside and a layer of rubber on the inside is cemented to the tube. [John H. Poole, Brockton, Massachusetts, assignor to Reinforced Inner Tube Co., Brockton, Massachusetts. United States patent No. 1,179,033.]

**MANDRELS FOR SPLICING TUBES.** Both inner and outer mandrels are slotted their entire length, the latter being provided with an annular passage through which air is forced, blowing the end of the inner tube that is on the larger mandrel over the end of the tube on the smaller mandrel, thereby forming the splice. [Dempsey Lowe, East Akron, Ohio. United States patent No. 1,179,200.]

**A NEW TIRE BUILDING TOOL.** This novel tool consists of a round helical spring that revolves on a suitable support and is used as a hand stitcher in tire building. [Wilhelm Kaufmann, New York City, assignor to Hartford Rubber Works, Hartford, Connecticut. United States patent No. 1,179,528.]

**TIRE FLAP VULCANIZER.** Flaps are made of straight fabric instead of bias strip, formed and vulcanized on a circular-shaped vulcanizer provided with clamps accommodating a plurality of flaps. [Thomas C. Marshall, Akron, Ohio, assignor to Kelly-Springfield Tire Co., Jersey City, New Jersey. United States patent No. 1,179,738.]

**BEAD WIRE WRAPPING MACHINE.** An endless wire hoop is expanded to nearly the contour of a circle by a series of concentric pulleys which carry it in a circular path through a rotary shuttle that applies the tape helically on the hoop. [Thomas Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,179,545.]

**BEAD CLEANING MACHINE.** Beads are repeatedly passed through guides having helical grooves which present the different faces of the beads to the buffing wheels that remove the dust and bloom. [Thomas Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,180,310.]

**BUTT-ENDED INNER TUBES.** The two ends to be joined are considerably smaller in diameter than the main tube and a locking ring on the extremity of the male end abuts against an annular thickened extremity on the female end. [Dunlop Rubber Co., Limited, 14 Regent street, London, S. W., and Colin Macbeth, Aston, Birmingham, England. British patent No. 4693 (1915).]

**PNEUMATIC TIRE MOLD AND CORE.** In this type of mold the inner part is closed at the last part of the operation so that the

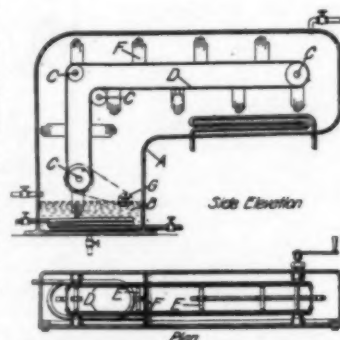
beads can be inspected before the final closing. [F. A. Byrne, 2 Ludgate Hill, Birmingham, England. British patent No. 9454 (1915).]

## MACHINERY PATENTS.

### DIPPING AND DRYING MACHINE.

**R**UBBER articles are made on this machine by successively dipping a form in rubber solution, and drying each coating separately in the presence of heat and a reduced air pressure of a vacuum.

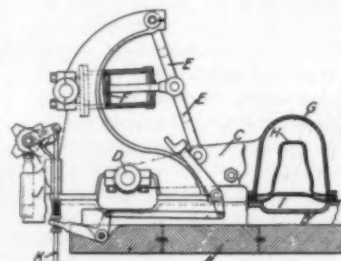
This apparatus is shown in side elevation and plan, the enclosed chamber *A* containing the solution at *B*. The four sprocket wheels *C*, revolved by a hand crank, drive the two endless chain belts *D*, that support a series of cross bars *E* on which the forms *F* are mounted. Paddle wheel *G* acts as an agitator for stirring the solution.



Heat is applied to the upper part of the chamber by steam coils, and in order to maintain the solution at constant, low temperature cooling coils are provided at the bottom of the solution chamber. Should it be desirable to separate the solution from the upper chamber to prevent overheating and evaporation during the drying operation, a two-part sliding partition is fitted in the tank above the solution. Pipes for solution inlet and outlet and vacuum connections are provided. [Carl S. Williams, New York City, assignor to Revere Rubber Co., a corporation of Rhode Island. United States patent No. 1,180,358.]

### AIR PRESSURE ROLLING MACHINE FOR FOOTWEAR.

In the manufacture of rubber shoes, it is necessary to assemble the various parts on a last, each component part being hand rolled or "stitched" as it is called, to compact the various layers into a homogeneous article. This hand work requires considerable skill and strength on the part of the operator, all of which is eliminated by this novel machine.



Referring to the illustration, base *A* supports the bed plate that has a depression *B* to accommodate the last to be operated upon. An arm *C* pivoted at *D* is raised and lowered by toggles *E*, *E* controlled by the air piston *F*. The outer part of this arm constitutes a dome-shaped cover *G* with a bottom flange that cooperates with rings for clamping the rubber diaphragms *H* and *I*. The former approximates the upper shape of the last and the latter conforms to the lower part.

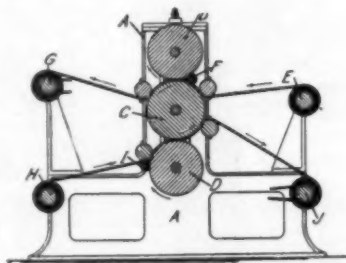
When the cover is raised, the shoe—previously built up on the last without hand rolling—is placed on the lower diaphragm. The cover is then lowered and air or water pressure applied by automatically controlled valves *J*. Thus the air contained within the mold will be forcibly excluded and the diaphragms pressed evenly around the last, firmly compacting the materials of the shoe, which is now ready for vulcanization. [Joseph W. Moore, Newton Highlands, Massachusetts, assignor to Boston Rubber Shoe Co., Boston, Massachusetts. United States patent No. 1,181,083.]

**THE KEARNS MULTIPLE FRICTION CALENDER.**

In this invention a series of pressure rolls are geared in vertical alignment, driven at different speeds relative to the adjacent roll, and arranged to friction with rubber a plurality of fabric webs.

Referring to the illustration, which is a vertical section of the calendar, *A* designates one of the side frames that support the rolls *B*, *C*, and *D*.

A web of fabric *E*, led by guide rollers, passes under the bank of rubber stock *F*, and between the rolls *B* and *C*, where it is frictioned, and then wound up at *G*. At the same time another web of fabric *H* is fed past the bank of rubber stock *I* and passes between the rolls *C* and *D*, where it is frictioned and finally wound up at *J*. [John Kearns, Chicopee Falls, Massachusetts, assignor to Fisk Rubber Co., Chicopee Falls, Massachusetts. United States patent No. 1,179,634.]



**TUBING MACHINE FEED.** A roll located in the feed hopper forces the material between the convolutions of the stock worm. [George F. Fisher, Plainfield, New Jersey, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,178,908.]

**IMPROVED TUBING MACHINE HEAD FOR INSULATED WIRE.** A tubing machine head is provided with a by-pass for the material so that the machine can be quickly put in running condition without disturbing the setting of the die. [Otto P. Houben, Akron, Ohio, assignor to The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,180,399.]

**VULCANIZING CONTINUOUS SHEETS.** The sheets of unvulcanized rubber are passed between an upper and lower series of relatively staggered heating drums, and at the same time are dusted with talc to prevent adherence to the drums. [E. T. Fenwick, attorney, 600 F street, N. W., Washington, D. C. British patent No. 4,139 (1915).]

**MACHINE FOR INLAID TILING OR SHEETING.** The different sheets of rubber stock are passed around rollers equipped with dies, that cut out the pattern mosaics, which are then deposited on a suitable backing and the whole pressed and vulcanized. [E. T. Fenwick, attorney, 600 F street, N. W., Washington, D. C. British patent No. 4,140 (1915).] A similar machine was illustrated and described in THE INDIA RUBBER WORLD, June, 1915, and May, 1916.

**DOUBLE SPREADING MACHINE.** The fabric is proofed on one side and passed under the steam-heated table where the solvent is removed. It is then reversed, proofed on the other side and passed over the steam-heated table, which assists evaporation of the solvent. [A. Olier & Co., Clermont-Ferrand, France. British patent No. 8757 (1915).]

**INDUSTRIAL TRUCK WHEELS.** A solid tire construction adapted for use with small wheels, consisting of side plates bolted together, and an annular band of metal embedded in the rubber tire. [A. B. Williams & Co., Weaman street, Birmingham, England. British patent No. 11,165 (1915).]

**COAGULATING LATEX WITHOUT CHEMICAL OR MECHANICAL AGENTS.** This invention consists in pouring the undiluted latex into horizontally arranged shallow pans, forming a thin layer of uniform thickness by exposing the latex to sun and air. [Julius Schadt Medan, Sumatra. British patent No. 12,002 (1915).]

**BEARING FOR WASHERS AND MILLS.** These are mounted on the frames, without side pieces or brackets, and connected by bolts of such tensile strength as to give way under an unusual strain. [Deventer Ijergietterij en Machinefabrik and Reinout van

Volten, both of Deventer, The Netherlands. British patent No. 13,776 (1915).]

**OTHER MACHINERY PATENTS.****THE UNITED STATES.**

- 1,181,085. Repair vulcanizing device for rubber tires. J. B. Rosenstein, assignor to The Marvel Accessories Manufacturing Co.—both of Cleveland, Ohio.
- 1,181,987. Repair vulcanizer. E. Bellerose, Watervliet, N. Y.
- 1,182,199. Machine for molding tubes. W. Norris, assignor to the B. & R. Rubber Co., both of North Brookfield, Mass.
- 1,182,598. Apparatus for making hollow rubber articles. H. R. Strauss, Cleveland Heights, Ohio.
- 1,182,599. Apparatus for making hollow rubber articles. H. R. Strauss, Cleveland Heights, Ohio.
- 1,182,700. Cement applying machine. L. Muther, West Newton, Mass.
- 1,182,711. Tubing machine. V. Royle, Paterson, N. J.

**THE DOMINION OF CANADA.**

- 167,334. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,335. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,336. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,369. Vulcanizing apparatus. J. W. Arthur, Warren, Ohio.
- 167,380. Shoe sole vulcanizing and applying apparatus. G. F. Butterfield, West Newton, Mass.
- 167,412. An apparatus for making tire forming strips. J. T. Lister, Cleveland, Ohio.
- 167,711. Machine for plastic materials. The Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of H. J. Hoyt, Detroit, Mich.
- 167,945. Vulcanizing apparatus. W. F. Stearns, Exeter, N. H.

**THE UNITED KINGDOM.**

- 24,037 (1914). Slitting and rewinding machine. E. C. R. Marks, 57, Lincoln's Inn Fields, London.
- 24,580 (1914). Rolls for mixers and calenders. Miller & Co., and J. White, London Road Foundry, Edinburgh.
- 460 (1915). Embossing or molding india rubber. C. Woollett, 176 Rice Lane, Walton, Liverpool.
- 505 (1915). Machine for grinding and polishing rubber. J. C. Prims, W. F. Smith, and Duplex Molding Sander Co., Hornell, N. Y.

**NEW ZEALAND.**

- 36,386. Tire cover or casing manufacture. The Dunlop Rubber Co., Limited, 14 Regent street, Westminster, England. (Assignees of Colin MacBeth, of Manor Mills, Salford street, Aston, Birmingham, Eng., works-manager.)

**PROCESS PATENTS.****THE UNITED STATES.**

- 1,182,071. Process of treating automobile tires and other like articles for separating the rubber and fabric. C. P. Bary, assignor to H. P. C. G. Debaugé, both of Paris, France.
- 1,182,200. Method of preparing strips of rubber for attachment to leather and the product. W. Norris, assignor to the B. & R. Rubber Co., both of North Brookfield, Mass.
- 1,182,308. Making tires with an embossed tread. G. J. Paynter, Philadelphia, Pa.

**THE DOMINION OF CANADA.**

- 167,046. Pneumatic tire assembling method. H. W. van Meeteren, assignor, A. Edwards and H. Headley, each an assignee of a third interest—all of Birmingham, Warwick, England.
- 167,481. Method of making convex or concave bodies of felt, etc. The Scholl Manufacturing Co., Incorporated, Chicago, Ill., assignee of D. W. Anderson, Stockwell, Indiana.
- 167,508. Composition for tires. J. Flint and G. Bolton, Five Dock, and W. A. McLauchlan, Sydney, co-inventors—both in New South Wales, Australia.
- 167,550. Process of making welt inner soles which consists in superimposing two sole shaped sections with a layer of gutta percha between. W. A. Knife, Ward Hill, Mass.

**THE UNITED KINGDOM.**

- 24,235 (1914). Vulcanization of rubber covered electric conductors. W. Geipel, 72a, St. Thomas street, Southwark, London.
- 24,829 (1914). Driving bands. E. E. Hodgkins, Grange Mills, Bermondsey, London.

**THE FRENCH REPUBLIC.**

- 478,705 (May 9, 1914). Process for manufacturing molded articles with holes from plastic material. A. Thieblé.
- 478,907 (June 4, 1915). Insulating material and process for its manufacture. MacFarland and Shoemaker.



## New Goods and Specialties

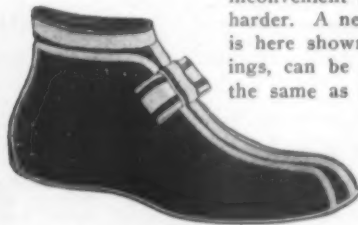
### WILLIAMS' PATENT VIOLIN CHIN REST.

**V**IOLINISTS frequently suffer from chafed and irritated skin on the chin, owing to the position in which they are obliged to hold their instruments. The advantage of a chin rest that will obviate this difficulty is self-evident, and this claim is made for the Williams' patent. This chin rest is made of soft rubber of good quality, not likely to harden with use. Its flexible quality allows freedom of motion without the friction that is the fundamental cause of sore chins. In use it requires but slight pressure to hold the violin in position. It is light in weight and the metal bars are unusually far apart, distributing the pressure on the ribs of the violin, thus avoiding the danger of cracking or otherwise injuring the instrument. It sets up well from the violin, rendering the use of a pad unnecessary in most cases. The top of the chin rest is easily detached and can be replaced at small cost. [Carl Fischer, New York City.]



### THE "UNIKA FUTFIT" BATHING SHOE.

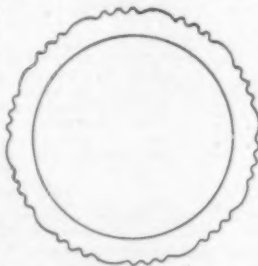
At many beaches it is necessary to protect the bather's feet against pebbles and rocks. Many bathing shoes used for this purpose are heavy and stiff-soled, and are not only inconvenient but make swimming the harder. A new style of bathing shoe is here shown which, having no laces, can be put on and off quickly the same as a stocking and will always stay on the feet. These shoes are very light weight, do not absorb water, and dry out quickly. The soles are of rubber and it



is claimed will positively keep the wearer from slipping on a wet diving board, a heaving float, or slippery rocks. What will commend itself to the ladies is that this line of shoes is made in a number of handsome colors and combinations, to match or harmonize with the bathing suits and caps. They are supplied in low shoe and ankle heights. [United States Rubber Co., New York City.]

### SCALLOPED FRUIT JAR RING.

The thin rubber ring that fits so snugly between the cover and the jar holding canned fruit, though a small affair, is an important feature in the preservation of the contents. As an article chosen solely for its utility little attempt has hitherto been made to beautify it. However, one has appeared upon the market having scalloped edges which add to its utility an attractiveness which may appeal to the feminine mind. When this ring is applied to the fruit jar and the cover is fastened down, the scallops form a frill beneath it, but, more important than this, the wider surface is claimed to afford additional security and protection. [Mechanical Rubber Co., Cleveland, Ohio.]



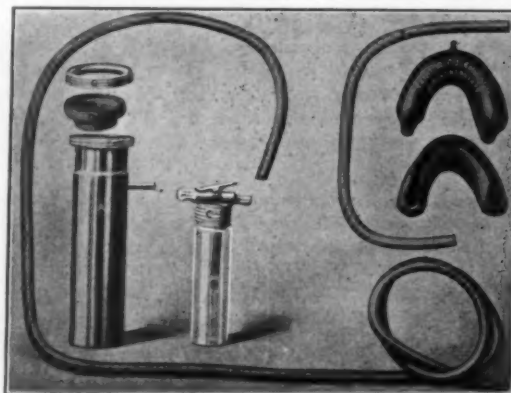
### PIVOT SLEEVE GOLF COAT.

In the popular game of golf, absolutely free muscle and shoulder play is essential for an effective stroke. The ordinary coat sleeve cuts short the free swing of the arm by binding at the shoulder, and the special feature of the golf coat shown herewith is designed to eliminate this difficulty. Self-expanding plaits at the top of the sleeve allow unrestricted motion of the arm, adapting themselves to the various movements required, while in normal position the plaits are invisible. These coats are made of various sporting fabrics, including waterproofed cloths and rubberized textures. While specially designed for golf, they are excellently suited for use in trap shooting, motoring and general sporting wear. [Ph. Weinberg & Sons, New York City.]



### IMPROVED DENTAL APPLIANCE.

An improvement in the invention [mentioned in THE INDIA RUBBER WORLD, September, 1914] for cleansing the mouth by vacuum drainage and for massaging the gums is illustrated here. Its use, by stimulating a full flow of blood to the tissues, it is claimed, is exceedingly beneficial in pyorrhea. It consists of an appliance of flexible rubber which fits comfortably over the jaw, with connections for inducing a partial vacuum when attached



to a water faucet. This is the invention of Dr. M. H. Cazier, who claims that its use will check the progress of the disease and with proper professional aid will result in complete recovery. The cylinder is attached to a water faucet by means of a rubber disk and screw cap, the force of the water regulating the amount of suction. There is a flask which receives the discharges during the treatment, this latter being provided with an alternating lever to regulate the action. The various parts are connected by rubber tubing. [The Sanitor Co., Chicago, Illinois.]

### THE "NOWAY" RUBBER SHEETING.

Rubber sheeting manufactured under the name of "Noway" is claimed to be a perfect substitute and can be used for each and every purpose where oiled silk is now employed. It is a fine texture white fabric, of light weight, with a light coating of pure Para rubber and it is claimed to be thoroughly waterproof and antiseptic, and having superior tensile strength. It is well

adapted for hospital uses, for bed sheets, pillow cases, surgeons' aprons, etc., and is also especially recommended for first aid treatment to glove a cut member and as a cover for a bandage. [American Rubber Fabric Co., Pittsburgh, Pennsylvania.]

#### "CLEAR-O-SCOPE" AUTO WIND-SHIELD CLEANER.

The annoyance and danger in driving an automobile in bad weather and not being able to see the road clearly is familiar to every motorist. A device to prevent clouding of the windshield from rain, fog or snow is here shown. It consists of two steel rods covered with rubber which are simply slipped over the top of the windshield, being provided with a handle which the driver grasps, sliding the rods back and forth and over the glass. One operation, it is claimed, cleans and dries the glass, presenting the absolutely clear surface necessary for safe driving. [The Zinke Co., Chicago, Illinois.]



#### ELASTIC HEAD BANDS.

The "Bike" elastic band here shown is intended to be worn by athletic sport enthusiasts of either sex, when indulging in their favorite exercise, for the purpose of keeping the hair in place and absorbing perspiration, that dims the vision of those players who wear glasses.



An elaboration of this band intended especially for the football player is also shown. It has straps going over the head and is worn low, covering the ears. These bands are made of cotton thread interwoven with rubber-covered thread, which, in the case of the football head-gear, affords protection for the ears without interfering with the hearing. They are supplied in three sizes—small, medium and large. [Sharp & Smith, Chicago, Illinois.]



#### "REALFLEX" ARMORED CONDUCTOR.

In electrical wiring in old buildings an armored wire is a practical necessity. It is difficult to secure the maximum of strength and at the same time the degree of flexibility needed. Again, the armor must be sufficiently smooth to be drawn between partitions and through small openings with a minimum of friction. It must be so finished that it will not injure the hands of the workmen while handling it. A piece of "Realflex" armored conductor is shown here, tied



in a double knot, thus practically illustrating its flexibility. The rubber-covered wire is completely protected by a heavily hot galvanized flexible steel wire, both rat proof and dust proof. This is wound about the conductor in a new and ingenious manner which gives this flexibility combined with maximum strength. A complete line of sizes is made, suiting all individual requirements. [The Western Conduit Co., Youngstown, Ohio.]

#### AN ARMY SANDAL.

The Canadian troops going into active service in the field in Europe will certainly be well shod. The army sandal shown here is the one officially adopted by the government. It is of tan colored rubber, specially designed to fit the heavy type of ankle leather boot which has been issued to the troops. The sole is of a coarse type, with extension heel lined with zero net, and a strong cotton reinforcement is placed inside the rubber at the heel and toe. Many thousand pairs of this special sandal have been ordered and duplicate orders have recently been received, thus showing their special adaptation for this heavy service. [Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]



#### THE "FRUIN-TOBIN" RUBBER BAR HORSESHOE.

Every winter storm brings its quota of injured horses, owing to their inability to keep from slipping and falling on wet or icy pavements. There is no better preventive than rubber, and this also serves as a cushion and relieves the jar caused by the hoof striking the pavement. The horse-shoe here shown is made of forged steel containing large channels at the heels and at the toe, into which rubber is vulcanized, extending across the heel and forming a bar. The sharp flange running from each side of the toe back to the quarters is an exclusive feature, and the width of the frame at the heel prevents pressure, therefore eliminating heel trouble. The shoe can be concaved to fit a drop sole foot and is said to be a positive cure for corns. Owing to the drop forged frame, it can be shaped to fit the hoof without heating. It will spread one-quarter of an inch, and is punched so that it can be nailed on securely and easily. [Fruin Drop Forge Co., Chicago, Illinois.]



#### TYPEWRITER CUSHION FEET WITH DOUBLE CAVITY.

The device here shown was adopted as most satisfactory by its inventor and manufacturer after detailed experimentation with other forms of support for the typewriter, such as built-up felt pads, a flat metal spring, sponge rubber, and other devices. These cushions are made of solid rubber so shaped as to be easily slipped over the feet of the machine. An exclusive feature is the double cavity. The upper cavity receives the foot of the machine, while the lower tends to create a vacuum under the typewriter and prevents it from creeping. The upper illustration shows the cushion in proper position. The lower gives a view of the bottom, showing the vacuum cavity, also a slight depression of the rim, which further serves the purpose. The use of these rubber feet is claimed to reduce the noise of operating about one-half, also giving a spring to the key action and softening the touch on account of their resiliency. By absorbing the shock, the nerves and strength of the operator are conserved, also wear and tear on the machine. [H. C. Nielson, Chicago, Illinois.]



**METAL AND RUBBER HOSE FOR GASOLENE.**

Rubber hose has its disadvantages when used to convey gasoline, for that volatile liquid is a solvent of rubber and causes rapid deterioration. A metal hose is better adapted for such purpose, but such a hose is hard to handle, and much trouble is apt to appear because of the difficulty in preventing leakage at the joints. A hose which is claimed to combine the advantages of both metal and rubber is here shown. The basis is a very flexible, smooth-bore metal tubing made tight by means of an



asbestos cord packing. This lining keeps the gasoline from coming in contact with the rubber tube which is vulcanized over it. The rubber tube is of special gasoline-resisting composition specified by the Underwriters' Laboratories. Outside of this is a heavy, woven cotton jacket to protect it from external wear. Couplings furnished with this are attached in such a manner that they will not leak nor pull off. Four sizes are carried,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and  $1\frac{1}{4}$  inch, and these are made in any desired lengths up to 50 feet. [American Metal Hose Co., Waterbury, Conn.]

**CLEAN-O-PORE VACUUM MASSAGE OUTFIT.**

This massaging device has many apparent advantages. It costs nothing to operate. No electricity is needed, and there are no wires or motor to get out of order. The outfit consists of rubber washer connections for round or oval faucets, three rubber



suction cups of varying sizes for body and face massage, seven feet of rubber tubing, a nickel-plated vacuum chamber, and a book of instructions, all arranged in a compact leather-covered box. To operate, attach to a wash basin faucet and turn on the water. A gentle suction is created, which increases in strength as the pressure of the water is increased. The massage cup can then be moved over the face or any part of the body desired, stimulating the blood vessels, opening the pores and drawing out waste matter. It is recommended for use after shaving, for the relief of muscular soreness, for bust development and scalp invigoration. Also, when applied to the spinal column, it is claimed to relieve nervousness. [The White Swan Manufacturing Co., New York City.]

**SPORTSMEN'S ENGRAVED GARTER.**

The customary clasp for men's garters is apt to slip or become unfastened if the wearer is indulging in active exercise, causing embarrassment and annoyance. A new form of fastening has been devised which is claimed to eliminate this possibility. The lower end of a narrow metal plate or strip is equipped with small beveled teeth which grip the hose securely and are claimed not to injure the finest hose. The elastic band fitting about the leg can be readily disengaged from the metal clasp for renewal, and the garter may

be put on or taken off in considerably less time than is usually required for that operation. These garters are also being produced with gold and silver bands, in place of other metal, to be engraved with the wearer's name, this valuable and distinctive style offering a good field for gift sets. [Whitely Exerciser Co., New York City.]

**VACUUM BREATHING APPARATUS.**

The purpose of the apparatus here shown is to increase the breathing capacity of the user and it is especially recommended for bronchial affections such as asthma, hay fever and similar disorders. The patient places a rubber hood over his nose and mouth so that all air reaching him must be drawn through the rubber tubing. This tubing is connected with a glass containing



water, which is permeated by air obtained through another independent opening. The patient is forced to draw the air he breathes through the water, or against an approximate pressure of six pounds, causing him to breathe deeply and vigorously. The pull of the vacuum apparatus operated by motor, connected through a second tubing with the breathing hood, facilitates exhalation. A mercurial register shows the lung energy expended. [Sanitarium Equipment Co., Battle Creek, Michigan.]

**SOMETHING NEW IN GOLF TEES.**

Every golfer recognizes the inconvenience and annoyance of building up tees with sand which may have lain in the boxes for weeks exposed to the weather. Such players will appreciate the Soluble Golf Tee,



for which is claimed several special advantages. It affords a constant height for the ball from the ground, eliminates the guesswork, always present when teeing with wet sand. It is so light that it offers a minimum resistance to

the sweep of the club in a "follow through," thus improving playing. This tee is made of gelatin, and if left upon the ground does not litter up as would a paper tee, but dissolves from the action of the weather and disappears. It is more durable than a paper tee and can be used over and over again. It cannot injure the club and if lost it costs so little no time need be wasted in hunting for it. These tees are made up in  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{5}{8}$  inch heights, packed in neat boxes containing 100, or in boxes of 18, as may be desired. It is claimed that a box of 100 will last the average golfer an entire season. [The Pittsburg Golf Tee Co., Wilkesburg, Pennsylvania.]



## The Editor's Book Table.

**PHYSIOLOGICAL PRINCIPLES FOR DETERMINING THE VALUE of the Various Rubber Tapping Methods.** By Professor Dr. Hans Fitting (translated by J. H. Renton). Copper & Sons, or "Times of Ceylon," office 27 Mincing Lane, both London, E. C., England. [Paper, 8vo, 51 pages.]

THE rubber planter is interested in bringing his plantation quickly into a profitable condition as a commercial enterprise and maintaining it in that state as long as possible. Doctor Hans Fitting has made a very careful study of the many questions involved and has indicated the way to be followed in investigating practical methods of tapping.

After explaining the functions of the root, stem and crown, the circulation of water, and showing that the ascending movement of water and the inorganic salts takes place in the wood, and the descending movement of the organic substances, chiefly in the bast, he reports the result of his experiments. Believing with Kneip that in all probability latex is not a nutrient juice, and, consequently, is of no importance as regards the circulation of the sap, he assumes that the latex is produced almost entirely, in the stem, however, it is also found to a small extent in the leaves, and therefore the nutritive substances required for this purpose must exist in the stem in sufficient quantities. If there is a deficiency of them, the renewal of latex must necessarily suffer and the supplementary latex may possibly deteriorate in quality.

It may be concluded that in rubber trees cuts made very deep in the cortex and in the bast disturb some very important vital functions of the tree. As the lactiferous vessels are situated chiefly in the bast, tapping should penetrate to the inner parts of the bast in order to secure a sufficient flow of sap, but must neither reach nor cut through the cambium.

Dr. Fitting's first tapping experiment was a spiral incision one and one-half times around the tree. This had the same effect as girdling because the circulation of organic nutrients in an oblique direction proceeds too slowly to provide the food supply required by the base of the tree. The tree is, therefore, obliged to draw on the reserve material from its reservoirs in the bark and wood.

In the second experiment the tapping cuts extended only over a quarter of the stem's circumference. There were six tapping areas, with bridges of bark between each. On three of these areas, the Bowman parer alone was used, and on the alternate three, the Bowman parer and Bowman pricker. The tapping period extended from November 8 to April 11. The tree was then cut down and examination showed that tapping cuts of this description can at most have only a local influence on the descent of organic food substances toward the base.

In the case of young trees, planters are warned against the use of all those tapping cuts by which the rectilinear connection of the vertical channels for the circulation of organic substances in the cortex and bast suffer a complete, or almost complete, interruption at any spot between the crown and the base of the tree.

Therefore, the spiral cut should be rejected, not because a great quantity of bark is in course of time removed from the tree, but because it completely destroys the food channels. Also, all those tapping methods are unsuitable, by means of which straight strips of bark are at first left between incisions and are removed in the second tapping period. Lastly, it is advisable to avoid all tapping methods, where the incisions are of such length that the nutrient and constructive substances within the tapping system must

travel too great a distance in an oblique or even horizontal direction.

In reviewing the value of tapping methods, the demands of practice must be considered, namely, that the latex should run easily and be easily collected, and the incisions be easily made. The herringbone incision must be given preference, here, as long as it embraces only a small part of the tree's circumference. The tapping system should extend only over a quarter of the tree's circumference. Successive tapping periods are to be confined respectively to the second, third and fourth quarters. Preference should be given to the half herringbone incision because of the short channels for flow of the latex.

The use of the pricker, as a tapping tool, cannot be recommended. Wherever the teeth of the pricker penetrate to the neighborhood of the cambium, the latter forms a new bark with many stone cells, but practically without lactiferous vessels. Where the pricker teeth did not penetrate through the inner cortex, new bark formed containing lactiferous vessels arranged irregularly. Bark on the tapping spots is renewed much more evenly if the knife is used exclusively, and is sooner ready for re-tapping.

The author's conclusions are summed up thus: "Do not begin to tap the trees till they are six or eight years old and are twenty inches in circumference, at three feet from the ground. Adopt the half, or the full herringbone V-shaped incision. Angle of sixty degrees is best. The tapping system must cover only a vertical strip of bark not exceeding a quarter of the tree's circumference. Tap daily, or on alternate days, with knife only. Prolong the tapping to five or six months. Avoid mixing latex of different quality, that from young and old trees, or from trees at different stages of tapping.

"It will be found advantageous to tap for two or three months, removing at most half the strips of bark between two incisions; after that pause for one or two months and then finish tapping the remainder of the bark in two or three months."

**GREEN BOOK FOR BUYERS.** PUBLISHED BY THE OIL, PAINT & Drug Reporter, New York City. [16mo, 206 pages. Paper bound. Price, \$1.00.]

This is a semi-annual publication, a guide for buyers of all sorts of oils, paints and drugs, being really a directory of manufacturers and dealers in these lines, arranged under the headings of the materials manufactured and sold. The book is a very small one, can be conveniently carried in the breast pocket, and seems very full and complete in every particular that would make it of use to heads of purchasing departments in all factories using oils and chemicals.

**THE MEDICAL WHO'S WHO, 1916.** THE FULTON-MANDERS PUBLISHING Co., London, England. [16mo, 1,140 pages. Price, 10s. 6d.]

The many members of the rubber trade who know A. Staines Manders and his able secretary, Miss D. Fulton, may be aware of the fact that the Fulton-Manders Publishing Co., of London, is publishing a number of important works concerning the medical profession and other lines, including several in the rubber field. The latest publication of this company is the one named above, a compact volume containing an immense amount of information regarding the medical profession of the United Kingdom. Brief biographies are given of the many thousand physicians. There are

also lists of those who have died in the preceding year; a general index of the towns with the names of the practitioners who live in each, and a brief mention of the medical periodicals published in the Kingdom. In all it is a book which must be of great value to those in or interested in the medical profession. We congratulate Mr. Manders on bringing out so complete a book, one showing care in compilation and excellent judgment in arrangement and publication.

#### NEW TRADE PUBLICATIONS.

**G**UTTA PERCHA & RUBBER, LIMITED, Toronto, Canada, is sending out a neat little pamphlet describing the "Maltese Cross" tires. The book is handsomely printed, the illustrations being especially clean, clear and distinct, and giving a very realistic idea of the tires, inner tubes, patches, rubber mats and other automobile accessories manufactured by this company. Each page is printed with a tinted background, which adds particular brightness to the illustrations, and the whole mechanical arrangement is most commendable.

The Link-Belt Co., Chicago, Illinois, in a compact little booklet describes and pictures the various forms of belt conveyors for handling separate pieces or packages from floor to floor or from one part of a factory to another. These various forms are pictured and described in such a manner as to give a very clear idea of their arrangement and appearance. The pictures show conveyors carrying such things as loaves of bread, or even ink bottles, while others are shown moving raw material, printed matter, trays of bottles, boxed and other goods, as well as barrels, loose packages, bales of various substances and similar articles. There is hardly a manufacturing establishment of any large extent in the United States which could not find use for one or another of such conveyors, and managers of industrial establishments might well read this little book with profit.

The B. F. Goodrich Co., Akron, Ohio, has published a wall calendar for the 12 months following April 1, 1916, which is likely to find space in many offices. Like all the Goodrich advertising, it is attractive, and this particularly so, being mainly a large lithograph of a crossing policeman escorting a daintily dressed little miss of perhaps ten years across the street while holding up traffic for the purpose. The aristocratic step of the little girl and the appreciative smile upon the face of the policeman make the picture especially noticeable. It is the work of Peter Newell, the well-known artist. A series of monthly leaflets forms the calendar portion, with bold, strong figures easily read from a distance.

The Racine Rubber Co., Racine, Wisconsin, has published a very attractive booklet entitled "The How and Why of Racine Tires," which gives a well written story of the factory, the method of manufacture and the kinds of tires manufactured by this concern, together with hints of value to users of these tires. The pamphlet is printed in two colors, has a bird's-eye view of the factory and many illustrations of the various departments, as well as of the tires, patches, reliners, casing boots, etc., manufactured by this enterprising company.

We have recently received a copy of the India-Rubber, Gutta-Percha & Electrical Trades Diary and Year Book for 1916, published by Maclaren & Sons, Limited, London, England. This is the regular edition of the convenient desk book which has been published by this firm for a number of years and which contains a large amount of statistical

matter and useful information of the British rubber trade besides the regular diary pages, which are so arranged as to give a liberal amount of room for accounts of daily transactions of the busy rubber man. In former editions these pages have been interleaved with blotting paper, the absence of which is in part made up this year by the insertion of several loose sheets of this material. The trade index comprises a long list of importers, brokers and rubber manufacturers throughout Great Britain and also information regarding export duties from rubber producing countries and other useful facts in convenient form for quick reference.

The National Fire Protection Association, Boston, Massachusetts, has printed a special pamphlet fully describing the sweeping fire in the residential section of Nashville, Tennessee, on March 22, at which there was an estimated property loss of \$1,500,000. It gives a panoramic reproduction of a photograph of the burned district nearly four feet long and shows what havoc the fire wrought. It also gives a map of the burned section showing area and extent of the fire. A similar booklet describes a \$10,000,000 fire in Paris, Texas, last March which resulted in a destruction of 1,440 buildings. In each case the conclusion is that, if sweeping fires in American cities are to be avoided, light frame construction and especially shingle roofs must be eliminated, and the recommendation is that there should be a legal abolition of the shingle roof and encouragement of that type of building construction which resists fire. This is a point well worth the consideration of those manufacturers who are erecting buildings for their plants or for their employees.

The board of directors of the Underwriters' Laboratories, Chicago, Illinois, under date of March 16, sent out their annual report, which shows the assets and liabilities, recommendation for the annual appropriation, and by-laws adopted. These items are followed by a statement descriptive of the organization, its purposes and methods, which portion of the book is illustrated with fine half-tone engravings of the building and various departments, thus giving a good idea of the thoroughness of the equipment for the purposes designed. In the latter portion of the book is shown in fac simile, printed in several colors, the many labels which are furnished by this corporation as guarantees of efficiency of the many machines, accessories, etc., which are examined and recommended by this establishment.

#### BALLOON FABRIC PATENTS.

German patent, No. 283,760, of September 9, 1913, was granted to Walter Seyd and Paul Benrath, both of Barmen, Germany, for a new balloon fabric made of a knitted textile having a rough surface instead of the ordinary smooth surface of woven balloon materials. This new fabric is said to be very strong, flexible and not easily torn. It is further stated that it can be used for covering the sustaining surfaces of aeroplanes as well as for making up balloon bags. It can be made of silk, cotton or any other textile, in any color, and it can be produced in large quantities at a low cost. It is especially easy to impregnate the new fabric with balata, which gives it great strength and makes it perfectly gas-proof.

German patent, No. 283,437, of January 11, 1913, to Metzeler & Co., of Munich, Bavaria, is for a process for building the hulls of airships from a material composed of several layers of fabric assembled in such a manner that the diagonally running warp threads of one layer cross the corresponding threads of the next layer of fabric, the strips of fabric being composed of a consecutive series of panels whose warp and weft threads cross one another.

## The Obituary Record.

### A THOROUGH RUBBER MAN.

**L** E BARON C. COLT, vice-president and general manager of the National India Rubber Co., Bristol, Rhode Island, died at his home in that town May 25, the result of a motor accident described in the Rhode Island letter, printed on another page in this issue.

He was born February 27, 1877, at Bristol, the only son of United States Senator Le Baron B. Colt and Mary Louise (Ledyard)



LE BARON C. COLT.

Colt. After attending the public schools he entered Brown University, and on his graduation from that institution, entered the employ of the National India Rubber Co. as an apprentice, learning the business thoroughly by practical experience, working successively in the cloth room, the mill room, the cutting room, the making room, the heater room. In each he began at the bottom, and learned the work as did any apprentice. He was appointed assistant superintendent, which gave him time for laboratory and experimental work,

for which line he developed unusual fitness. Then he became traveling salesman, and in 1904 he was selected as resident manager.

At that time the Bristol plant was a somewhat heterogeneous aggregation of buildings with considerable antiquated machinery. Rearrangement, consolidation, new buildings and equipment characterized his management, and the business developed from a maximum number of people on the pay roll of 1,700 to 3,300, and the output of shoes from 18,000 pairs to 44,000 pairs per day, and the insulated wire business from 60,000 to over 200,000 feet per day.

He was particularly careful about the health and welfare of his employes, and devoted considerable of his energy to bettering hygienic conditions in his plant. About three years ago he built a hospital for the better care of the workers, and personally organized it. As a result of his efforts on behalf of his operatives and his ability to cooperate understandingly with them he was held in high regard.

In 1904 he married Miss JouJou Edith Converse, daughter of the late Admiral George A. Converse, who, with three children survives him.

Mr. Colt possessed to a remarkable degree qualities of successful leadership. The son of a judge of the United States Court, and a nephew of Colonel Samuel B. Colt, president of the United States Rubber Co., he combined in a remarkable manner the judicial instinct of the one and the far-sighted business acumen of the other. He had the thorough loyalty of those who worked under him, the warm personal friendship of his business associates and the unbounded confidence of all with whom he came in close business contact. He will be mourned by a wide circle of friends.

### CHEMIST, ORGANIZER AND EXECUTIVE.

In the death of E. H. Pound of the Holland American Plantation Company, the United States Rubber Co. has lost one of its most valuable workers.

Edward Harold Pound was born at Pontiac, Michigan, April 12, 1886. Shortly after graduating from the high school, he went to Mexico on the railway survey for the Mazatlan Extension



E. H. POUND.

from Durango to the Pacific Coast. Returning in 1907, he entered the University of Michigan School of Forestry. During part of his time there, he acted as assistant in forest botany, and the summer of 1909 he spent in the U. S. Forest Service in Montana. In 1910 he left the University of Michigan to enter the employ of The Rubber Exploration Co., taking charge of the forestry and botanical ends of two extended exploration trips in South

America. In 1912 he entered McGill University, Montreal, to take up work in organic chemistry, specializing in biological chemistry, with particular reference to rubber, and graduated with the degree of B. Sc. in 1913.

Mr. Pound entered the service of the United States Rubber Co. on June 17, 1913, and after a year in charge of the crude rubber division of its general laboratories in New York, was selected by this company for the important post of director of the technical department of the Holland American Plantation Co., which operates its eastern plantations. In April, 1914, he left for his new position in Sumatra to undertake the task of organizing and conducting experimental work on a large scale on the important problems involved in the production of plantation rubber.

Mr. Pound's thorough training, an unusual experience, together with his good business sense and unbounded energy and enthusiasm, made his work a success from the beginning. His ability as a judge of men, and as an organizer and executive is shown by the excellence of the technical staff which he gathered around him, and by the smoothness with which this organization was able to carry on its work when Mr. Pound was forced to be absent on business, and later on account of ill health. In December, 1915, he was obliged to leave his work at Sumatra for a rest trip in China and the Philippine Islands. His health, however, failed to improve and he died on January 21, 1916, in Hong Kong.

Mr. Pound's breadth of vision and keen technical judgment have left a mark on the rubber industry of the East, and have resulted in a degree of achievement which most men would be proud of reaching at the end of a long business career. His death is a distinct loss to the rubber industry, to the company which employed him, and to the associates whose love and loyalty he won by his rare personal charm and uncommon breadth of nobility and character.



**A PIONEER ELASTIC WEB MAKER.**

William Rapp, one of the best known men in the field of elastic web manufacturing in this country died, at his home in Brockton, Massachusetts, May 19, aged 82 years.

Mr. Rapp was born in Staffordshire, England, in 1833. His father died two years later. There were no free schools there, and the boy received but scant education. At an early age he went to work in a webbing factory and by diligence and industry rose to the position of foreman and later established himself in the business in Leicester. In 1881, his factory was burned down, and he decided to come to America. Locating in Chelsea, Massachusetts, he joined forces with William and Thomas Martin, and formed the Elastic Gusset Co. Two years later, he formed a partnership with Albert Herbert, and built a webbing factory at Brockton, Massachusetts. This concern later became the Hub Gore Makers, with factories in Brockton, Rockland and Chelsea, Massachusetts, Bridgeport, Connecticut, and Camden, New Jersey, and is now a part of the more recently formed concern "Everlastik, Inc."

Mr. Rapp made his home in Brockton, and for many years supervised the work at the factory in that city. He served as a councilman in 1890, 1895 and 1896. He was a member of the Commercial Club, and a prominent member of the Porter Congregational church.

His wife died a few years ago. He is survived by a son, eight grand-children and four great-grand-children.

**AN ABLE EXECUTIVE.**

Aaron D. Weber, vice-president and general manager of the Canadian Consolidated Felt Co., Limited, died at his residence in Berlin, Ontario, Canada, May 7, at the age of 43 years. He was born on a farm near Berlin in 1873. In 1900 he started work as a shoemaker in the Berlin rubber factory. The following year he became a traveling salesman. When the Merchants Rubber Co. was founded in 1903 he joined that organization, and after the company passed under the control of the Canadian Consolidated Rubber Co., Limited, he served successively as assistant manager of the Merchants factory, manager of the footwear department at the Toronto branch, manager of rubber footwear production and sales at Montreal, general manager of the Canadian Consolidated Felt Co. at Berlin, and vice-president of the company.

Mr. Weber's career is a splendid example of what ambition and will-power can accomplish for a young man. Sixteen years ago he started as shoemaker in a rubber factory and at his death was vice-president and general manager of one of Canada's great industries.

His death is a distinct loss to the city of which he was a worthy citizen, and to the industry of which he was general manager. He is survived by his widow, father, sister, and two brothers.

**ORPHAN BRANDS NOT REGISTRABLE IN AUSTRALIA.**

A trade-mark decision of interest to those who are dealing with Australia is that recently announced in the matter of the National India Rubber Co., Bristol, Rhode Island, which made application to register the words "Empire Rubber Co." as a trade-mark for boots and shoes. There were several reasons why the application was not allowed, one being that it was printed in ordinary script and not displayed in a distinctive manner, another because the word "Empire," which is the principal feature of the trade-mark, was antedated by prior registrations for the same kind of goods. But the added reason, and the one most important as coming within the provisions of the Australian trade-marks act, was that it was not the name of a company, individual or firm actually in existence and the law officer held that the use of the words "Empire Rubber Co." would amount to a representation that the goods were manufactured, packed

or marketed by a company of that name when, as a matter of fact, they were not. It was also contended that the word "Empire" when used in a British possession would *prima facie* convey a reference to the British Empire and lead British subjects to believe that the goods were the product of a British company. Consequently, the use of the mark on the goods of the applicant would amount to a false trade description.

**STANDARDIZATION OF HOSE COUPLINGS.**

The Hose Coupling Committee of the National Fire Protection Association, in its report to that body at Chicago, states that there is an encouraging growth in the movement toward the general adoption of national standard hose couplings in order to secure reliable and efficient service in coöperation between fire departments of neighboring communities. It particularly praised the activities of the Ohio State Fire Prevention Association in its work of standardizing of hose couplings and fire department equipment in cities within 55 miles of Columbus, while similar work is in progress in and adjacent to other large cities in that State. New editions of "Hose Coupling Specifications" and "Couplings Record" have been printed. The latter shows a list of 2,222 towns, the equipments of which 894 are standard, and 1,328 adaptable. The committee, which consists of Howard L. Stanton, Norwich, Connecticut; H. C. Henley, St. Louis, Missouri; George E. Bruen and F. M. Griswold, New York City, suggests that the committee be enlarged by the creation of sub-committees selected from the membership of each State Fire Association, whose duty shall be to collate hose couplings and hydrant data for record, to urge the adoption of the standard and to foster coöperation between communities, and that the N. F. P. A. select one or more of its members to attend the conventions of the State Fire Marshals' Association to urge such coöperation and standardization.

**ANOTHER SCHOLARSHIP IN CHEMICAL ENGINEERING.**

In our May issue a brief announcement was made of the establishment of a scholarship fund endowed by Dr. Victor G. Bloede, of Baltimore, Maryland, the income of which, approximately \$500 a year, is to be devoted to financially assisting deserving young men to obtain an education in the field of industrial chemistry or chemical engineering, at any institution in the United States which may be designated or approved by the Chemists' Club of New York City. This club has since announced the establishment of another scholarship fund, the income of which, approximately \$400 a year, is to be devoted to the same purpose. This scholarship has been endowed by William F. Hoffmann, president of the American Oil & Supply Co., Newark, New Jersey, and one of the founders of the Chemists' Club of New York. The benefits of both these funds will be open to properly qualified applicants without restriction as to residence, and may be effective at any institutions in the United States which may be designated or approved by the Chemists' Club. The qualifications and full particulars regarding these scholarships can be obtained by addressing the Bloede Scholarship Committee and the Hoffmann Scholarship Committee of the Chemists' Club, 50 East 41st street, New York City.

**THE STORAGE OF RUBBER GOODS.**

An anonymous writer in "Gummi-Zeitung" states that light, high and low temperature, and moisture tend to shorten the life of rubber goods. Blue and violet light rays are particularly harmful. Red light is practically without effect. He claims that the color of goods seems to have some influence, bright colors acting in some degree as preservatives, and that sulphur bloom may have a certain protective effect.

## The New York Preparedness Parade.

THE parade in New York City on May 13, of over 125,000 citizens was a wonderful demonstration of the stand taken by representatives of leading trades and professions on the question of preparedness for national defense. The rubber trade, as has been the case on similar occasions, was amply represented, there being by actual count,



AMEDEE SPADONE, MARSHAL.

2,415 rubber men in the procession. Great credit must be given the committee in charge, H. G. Cleveland, W. G. Ryckman and H. S. Vorhis, upon whom fell most of the details and arrangements, and the result proved the thoroughness with which these duties were performed. The military direction was under the command of Amedee Spadone, who had as his aids, H. H. Barnard, H. G. Cleveland, S. T. Hodgman, W. G. Ryckman, T. A. Aspell and H. S. Vorhis. Captain Spadone was chosen as marshal of this division because of his training in the New York National Guard. His insignia of office was a handsome blue sash, the aids being distinguished by yellow silk sashes. The 2,400 marchers wore straw hats and each carried an American flag. On the coat of each was a medal of oxidized

silver and celluloid, showing two American flags, attached by a blue ribbon which read: "Rubber Division. Citizens' Preparedness Parade. May 13, 1916." A gorgeous banner of purple silk, with cloth of gold border, fringes and tassels, read: "The Rubber Industry of America," and was adorned with the seal of The Rubber Club of America, Inc.

The Rubber Division consisted of five regiments, each wearing a distinguishing color; the first regiment, under Colonel R. C. Fisher, red; the second, under Colonel Jackson, blue; the third, under Colonel M. Charles Schweinert, green; the fourth, under Colonel J. R. Parker, brown; and the fifth, under Colonel William E. Bruin, yellow.

Various rubber houses were represented by large delegations, the United States Rubber Co. heading the list with 884 men, all of whom wore straw hats, the bands of blue and white ribbon be emblazoned with the circular monogram trade-mark of the company. A. Schraders' Sons, Inc., were represented by 472 men; The B. F. Goodrich Co. by 104; Ajax Rubber Co., 109; New Jersey Car Spring & Rubber Co., 70; American Hard Rubber Co., 60; Kelly-Springfield Tire Co., 49; Hodgman Rubber Co., 46; Firestone Tire & Rubber Co., 40; while those which furnished one or two files of representatives included:

Parker, Stearns & Co., Goodyear Tire & Rubber Co., L. Littlejohn & Co., Core & Herbert, Obalski & Sweeney, Inc., Henderson & Korn, Consolidated Stamp Co., Republic Rubber Co., Okonite Co., H. Muehlstein & Co., Arnold & Zeiss, F. H. Cone, Vulcanized Rubber Co., Gutta Percha & Rubber Manufacturing Co., New York Mackintosh Co.

It would seem that every rubber house having its headquarters or branch offices in New York City was anxious to be repre-



RUBBER DIVISION OF THE PREPAREDNESS PARADE PASSING THE NEW YORK PUBLIC LIBRARY.

sented, and besides those mentioned above, the following were represented among the marchers:

Mohawk Rubber Co., Tyer Rubber Co., New York Insulated Wire Co., Oxford Tripoli Co., Gibney Tire & Rubber Co., Falls Rubber Co., Knight Tire & Rubber Co., R. J. Caldwell & Co., Continental Rubber Works, Thomas Malone, C. W. Niles, Rolle Rubber Co., U-Glu Supply Co., Edward Maurer & Co., Charles Rubber Co. of New York, W. H. Stiles, W. G. Ryckman, Aldens' Rubber Co., Elkhart Bros., Pennsylvania Rubber Co., Combination Rubber Co., Empire Rubber & Tire Co., Rex Rubber & Novelty Co., Davol Rubber Co., Seamless Rubber Co., Canton Rubber Co., Miller Rubber Co., Miller Tire Corporation, Boston Woven Hose & Rubber Co., Meyer & Brown, Boston Belting Co., F. B. Ross & Co., A. Beers, Condensite Co., R. J. Pierce, Ritchie Ryan Rubber Works, Gould Commercial Co., Continental Rubber Co. of New York, W. H. Stiles, W. G. Ryckman, Aldens' Successors, Limited, Earle Bros., W. Hammesfahr & Co., Robert Badenhop Co., Inc., Chas. E. Wood, Richard Wohlberg, Rubber Trading Co., Pell & Dumont, Fred Stern & Co., A. V. W. Tallman, A. B. McNamara, Robinson & Co., Paul Bertuch, Eastmond & Co., Allcock Manufacturing Co., Jacob Blyn, U. S. Rubber Reclaiming Co., Inc., Converse Rubber Shoe Co., Raw Products Co., New York Rubber Co. and THE INDIA RUBBER WORLD.

The Rubber Division had the place of honor at the head of the trade section of the procession, immediately following the Municipal Departments. The trade was further honored in that George B. Hodgman, Van Henry Cartmell and H. Stuart Hotchkiss were chosen to escort the Mayor to the grand reviewing stand. The music for the Rubber Division was furnished by the First Regiment Band of New Jersey, 36 pieces; the band of the Mission of Immaculate Virgin, Staten Island and Manhattan, 70 pieces, and the Oriental Fife and Drum Corps of Stamford, Connecticut, 21 pieces.

It must be acknowledged that the fine marching of the rubber men aroused the plaudits of the half million onlookers who lined the entire route of the procession. All the marchers reached Fifty-seventh street at the end of the parade in fine condition, well satisfied that the rubber trade had done its full duty in showing its stand upon this important national question.

Captain Spadone has received from Colonel Sherrill, the grand marshal of the parade, a letter of thanks and appreciation for the splendid showing made by the Rubber Club. The letter closes as follows:

The pleasantest memory of my life will always be my service with you in this work, and I shall always remember you with affectionate regard.

You will please convey to your command my warmest thanks and heartiest congratulations for their splendid coöperation in our patriotic crusade.

The premises of the Gutta Percha & Rubber Manufacturing Co., on Duane street, were used as the headquarters and rendezvous for the Rubber Division, and in appreciation of this there has been presented to the company a beautiful silver loving cup bearing this inscription:

The Gutta Percha & Rubber Manufacturing Co., from the rubber trade of New York and vicinity in appreciation of courtesies extended in connection with the Citizens' Preparedness Parade, May 13, 1916.

This cup, we understand, will grace Mr. Spadone's office, as a reminder, for all time, of this occasion.



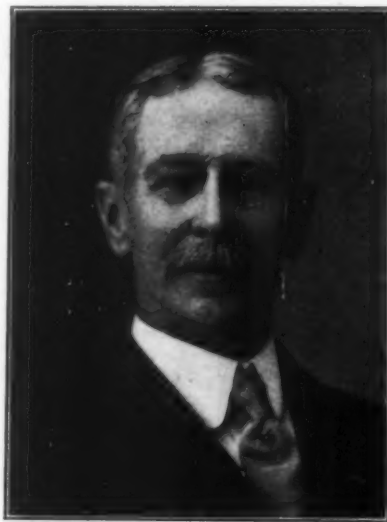
SILVER CUP PRESENTED GUTTA PERCHA & RUBBER CO.

## BOSTON'S PREPAREDNESS PARADE.

NEW YORK CITY'S great popular demonstration for preparedness set Boston an example worthy of emulation, and the latter city held a similar parade on Saturday, May 27, when between 50,000 and 75,000 citizens marched to show their sentiments on this question of the hour.

This was in many respects similar to the Sound Money parade of 1896, but far exceeded it in the number of marchers.

The rubber trade was well represented. Major H. P. Ballard of the Boston Rubber Shoe Co., was chosen marshal of this division. His appointments to act as honorary staff were: Col. Harry E. Converse and Capt. Lester Leland of the United States Rubber Co.; Capt. Francis H. Appleton of F. H. Appleton & Son, Inc.; George E. Hall of the Boston



MAJOR H. P. BALLARD, MARSHAL, RUBBER TRADE DIVISION, BOSTON PREPAREDNESS PARADE.

Woven Hose & Rubber Co.; Fred C. Hood, of Hood Rubber Co.; Ira A. Burnham, of American Rubber Co.; M. M. Converse, of Converse Rubber Shoe Co.; W. E. Piper, of Boston Rubber Shoe Co., and H. L. Williamson.

Assistant marshals of the division were P. R. Browne and H. H. Nance, of American Rubber Co.; E. H. Kidder, of United States Tire Co.; J. H. Learned, of Revere Rubber Co.; E. L. Phipps, of Boston Rubber Shoe Co.; J. W. Fellows, of Boston Woven Hose and Rubber Co.; Hugh Bullock, of Converse Rubber Shoe Co., and C. H. Peckham, of Boston Belting Co.

The rubber men rallied well, there being a total of 1,570 enrolled. Unfortunately, this division was given a position so far back in the line of march that it did not start in the parade until after 4 o'clock, a fact which undoubtedly prevented a much larger number of marchers. The houses represented included Boston Woven Hose & Rubber Co., Boston Belting Co., Converse Rubber Shoe Co., Hood Rubber Co., American Rubber Co., United States Rubber Co. of New England, Revere Rubber Co., Boston Rubber Shoe Co., Peerless Rubber Manufacturing Co., New York Belting & Packing Co., United States Tire Co., The B. F. Goodrich Co., Goodyear Tire & Rubber Co., Firestone Tire & Rubber Co., Kelly-Springfield Tire Co., Fisk Rubber Co., C. J. Bailey & Co., Republic Rubber Co., and Empire Tire & Rubber Co.

If numerically this division did not equal some of the others, it was no whit secondary to any other trade in soldierly bearing, fine marching and in enthusiasm. Major Ballard may well be proud as well as all who participated, of the representation of the rubber trade in this greatest popular parade Boston has seen in twenty years.

## CHICAGO'S PARADE.

Chicago, following New York and Boston's example, will have a parade on Saturday, June 3. We are informed that the rubber trade will be well represented.



## News of the American Rubber Trade.

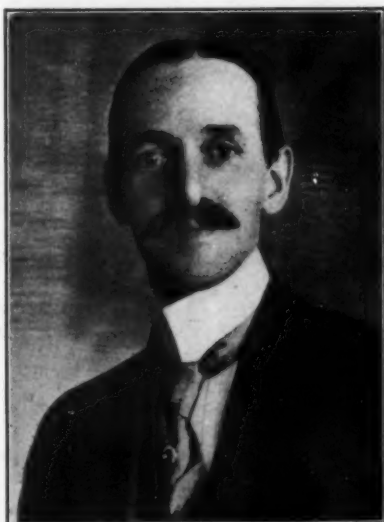
JOHN ACKEN.

ONE of the pioneer concerns in the rubber business is the New York Rubber Co., which had its beginning back in 1858. At that time William H. Acken and John P. Rider came together and built up the company that has, for half a century, been acknowledged as one of the most stable, conservative and reliable of all of those which make rubber goods.

The senior Acken was president for many years and was succeeded, in time, by his son, John Acken. The present head of the company, like his father, is averse to publicity and is quite content to go his way unheralded as long as his business prospers and he lives up to the family traditions.

Mr. Acken is a resident of Nyack, New York, where as an evidence of public spirit he is a member of the Nyack Business Men's Association and the Nyack Country Club. Fond of out-door sports, he was formerly an enthusiastic tennis player, but today confesses to being less keen for such strenuous exercise.

The object of this brief note is to add our congratulations to those of his employees, tendered May 2, upon the occasion of his fiftieth birthday.



JOHN ACKEN.

### BUSINESS CONSOLIDATION.

H. A. Astlett & Co., crude rubber importers and dealers, 117 Pearl street, New York City, have admitted to partnership F. H. Peaty and F. H. Sanford. Mr. Peaty has for many years been prominently identified with rubber interests in New York, and in 1906 with Samuel Kubic formed the Raw Products Co., with which house he was connected until 1913, when he sold his interest on account of poor health. Late in 1914 Mr. Peaty opened an office at 38 Vesey street, New York City, which he discontinued to form his present connection. Mr. Sanford was with the South American house of George A. Alden for 20 years.

H. A. Astlett & Co. took over the business of Shipton Green and have extensive foreign connections. In addition to its large rubber interests, this house is the export agent for the sale of Waltham watches and several other well known and standard American products.

One hundred and fifty cases of rubber which formed part of the cargo of the "Sandefjord" when that ship was seized by a British cruiser and brought into Halifax in November, 1914, were last month condemned for seizure by Justice Drysdale of the admiralty court. The "Sandefjord" was on her way from New York to Copenhagen and was allowed to proceed after this shipment of rubber was removed. Justice Drysdale held that whereas the rubber was shipped by one neutral to another, an enemy designation was intended. He also held that a description of the article as "gum" was deceptive, further justifying the seizure.

### RUBBER CLUB 1916 OUTING.

The annual outing of The Rubber Club of America, Inc., will be held July 18, at the Vesper Country Club, near Lowell, Massachusetts, the same place as last year's outing. The committees are making extensive plans for the occasion. Probably the same arrangements will be made for special trains from Boston to the Club grounds and return. Special parties are being made up in Akron, Trenton and New York, and if a sufficient number can be secured from each of these points a special train will be run landing the members directly at the Vesper Country Club on the morning of the outing. The committee having the details in charge is as follows: P. E. Young (chairman), Acushnet Process Co., New Bedford, Massachusetts; Robert L. Rice, Hood Rubber Co., Boston, Massachusetts; F. H. Appleton, Jr., F. H. Appleton & Son, Inc., Boston, Massachusetts.

### THE PREPAREDNESS PLAN.

Five hundred and twenty-one men connected with the rubber trade in different parts of the country have been nominated as members of the District Preparedness Committees planned by The Rubber Club of America, Inc., to secure the coöperation of the entire industry in this nation-wide movement for defense. Few of our important industries depend so completely upon imported raw material as does the rubber trade, and therefore this matter of national preparedness is a vital one to all connected with this trade. The plan of the Rubber Club is to so interest the rubber people in each city, town or district that local clubs or committees may be formed for the purpose of exerting a broad influence on public opinion in regard to national defense.

The Rubber Club, at its annual meeting last February, appropriated \$1,000 for the purpose of forming such local bodies, and supplying them with appropriate literature, posters and information. This fund is almost exhausted, and contributions are now being solicited by a circular letter sent, not only to members of the club, but to the trade generally.

### RUBBER COMPANY DIVIDENDS.

At a meeting of directors of the Lee Rubber & Tire Corporation held on April 27, a quarterly dividend of 50 cents per share and an extra dividend of 25 cents per share was declared, payable June 1 to stockholders of record May 15.

On May 9 the directors of the Ajax Rubber Co., Inc., declared a dividend of 2½ per cent, payable June 15 to stockholders of record May 31.

The Hood Rubber Co. paid a regular quarterly dividend of 1¼ per cent on the preferred stock on May 1, to stockholders of record on that date.

### RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on May 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 45 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new).....	66½	68
Firestone Tire & Rubber Co., common.....	840	860
Firestone Tire & Rubber Co., preferred.....	113	114
The B. F. Goodrich Co., common.....	75	77
The B. F. Goodrich Co., preferred.....	114½	116
Goodyear Tire & Rubber Co., common.....	392	396
Goodyear Tire & Rubber Co., preferred.....	105	106
Kelly-Springfield Tire Co., common.....	71	73
Kelly-Springfield Tire Co., first preferred.....	95	99
Kelly-Springfield Tire Co., second preferred.....	..	..
Miller Rubber Co., common.....	300	..
Miller Rubber Co., preferred.....	115	..
Portage Rubber Co., common.....	85	88
Portage Rubber Co., preferred.....	107½	108½
Rubber Goods Manufacturing Co., preferred.....	..	..
Swinehart Tire & Rubber Co.....	83	84
United States Rubber Co., common.....	54	55
United States Rubber Co., preferred.....	108	109

## PERSONAL MENTION.

William S. Gordon, general representative of the General Rubber Co., New York City, returned last April from the Far East, and after a short visit to the home office, sailed on the 26th of that month for Manaus, Brazil, where he will relieve D. S. W. Aimers, the general representative there. The latter will leave for England on Mr. Gordon's arrival to join a British regiment and proceed to the front.

William A. Eden, secretary of the Canadian Consolidated Rubber Co., Limited, Montreal, married on April 20 Miss Mabel Spencer Henderson of that city. His friends and office associates presented to him a purse of gold on this occasion. The wedding trip was to southern cities.

R. C. Ritchie has been transferred to the main office of the Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania. He was formerly in charge of the office of the automobile equipment sales service station of this company at Chicago, Illinois.

Henry G. White, formerly with the Panhard Oil Co., is now representing the Pennsylvania Rubber Co., covering the territory of New Hampshire and Vermont, with headquarters at the Boston, Massachusetts, branch, 735 Boylston street.

Russell Ward Earle, whose retirement from the firm of Earle Brothers, crude rubber dealers, was mentioned in the April issue of THE INDIA RUBBER WORLD, was married May 9, the bride being Evelyn, daughter of Mr. and Mrs. George W. Beavers, of New York City. The marriage ceremony was at the Church of the Heavenly Rest, and the wedding reception at the Ritz-Carlton Hotel, New York City.

Theodore Hofeller, president of Theodore Hofeller & Co., Buffalo, New York, has recently returned from California, where he and Mrs. Hofeller have spent over three months.

Warren MacPherson, proprietor of the Cambridge Rubber Co., Cambridge, Massachusetts, had a curious experience on the Fall River Line boat between Fall River and New York one day last month, having been attacked by a negro who broke into his state-room. Mr. MacPherson was obliged to pass several days at the Stillman Infirmary, Cambridge, nursing cuts and bruises received from the negro's blackjack. It is thought that no very serious results will follow.

Arthur C. Kingston has been appointed general sales manager of the Peerless Rubber Manufacturing Co., New York City. Mr. Kingston was formerly connected with the Revere Rubber Co. for 23 years, the greater portion of that time in the sales department, at Boston, Chicago, and the home office, Chelsea, Massachusetts.

The Barrett Co., New York City, is notifying its customers that owing to the greatly increased cost of drums, charges on 100 to 110 gallon drums have been advanced to \$15 each and on 50 to 55 gallon drums to \$8 each, and calls attention to the necessity that the drums be emptied and returned promptly.

Harrison Bros. & Co., Inc., Philadelphia, Pennsylvania, manufacturers of chemicals, acids and pigments, have removed their New York office to 80 Maiden Lane, to better serve the chemical trade.

In a recent decision upholding the decision of the commissioner of patents refusing registration to the word "Ford" as a trade-mark for rubber tires, the District of Columbia Court of Appeals held that a word which forms a part of a corporate name, even though written or printed in a peculiar and distinctive manner, is unregistrable as a trade-mark.

The Lancaster Tire & Rubber Co., Lancaster, Ohio, is adding additional tire building equipment and will manufacture an impression tread tire as well as its present "Wiregrip" tire.

## MR. STEDMAN IN NEW YORK.

**A**LTHOUGH by birth, training and residence a Boston man, after the first of the present month, Arthur W. Stedman becomes a New Yorker. As manager of the crude rubber department of the Hagemeyer Trading Co., he will be found at 17 Battery place. For a right-hand man he has selected Lewis C. Duffy,

who was with him for 14 years, a part of the time at the Manaus branch. The whole trade know Mr. Stedman, as he has been an active factor in rubber for more than 25 years. At various times he has visited South America and Europe and has thus gained knowledge, friends, and established connections that are of great value. It will be recalled that at the great rubber exhibition in New York Mr. Stedman not only handled the crude rubber from Brazil, for which he was made



A. W. STEDMAN.

an honorary member of the Commercial Association of Manaus, but he also took over all the plantation rubber that was sent in by the British Rubber Growers' Association and by many Far Eastern planters. His wise and businesslike handling of this brought him in intimate touch with the most important plantation interests, a connection that he has since kept up.

The Boston business Mr. Stedman has sold to the Rubber Importers' Selling Co., which will continue it at his aforetime offices on Atlantic avenue.

## BATAVIA RUBBER CO.

At the annual meeting of the Batavia Rubber Co., Batavia, New York, May 9, the following directors were elected: George W. Hodges, William H. Remick, W. P. Berrien, C. M. Marvin and S. J. Bailey. The directors then elected the following officers: George W. Hodges, chairman of the board; W. P. Berrien, vice-president; C. M. Marvin, treasurer; S. J. Bailey, secretary; William S. Whitman, assistant treasurer.

Plans are under way for the erection of a new office building, the present office space of the Batavia company being needed for factory purposes owing to increased business.

## HALIFAX RUBBER CO. TAKES OVER PRENZEL COMPANY.

The Halifax Rubber Co., Halifax, Pennsylvania, has taken over the business of the A. H. Prenzel Rubber Co., of Halifax, with the intention of continuing the manufacture of surgeons' gloves and finger cots carried on by the latter company, and possibly branching out in other lines later on. The personnel of the Halifax Rubber Co. is as follows: John H. Klingman (president Halifax Chair Seat Co., Millersburg, Pennsylvania), president; A. M. Smith (Grain & Coal merchant, Halifax, Pennsylvania, and vice-president Halifax National Bank), vice-president; P. S. Hill (cashier Halifax National Bank), secretary and treasurer; James E. Neitz, manager. A. G. Bashoar, president Alvord Reamer Works, Millersburg, Pennsylvania, and controlling factor in the Millersburg Fifth Wheel Co., is also interested.

## NEW INCORPORATIONS.

Federal Rubber Co., The, April 26 (Massachusetts), \$10,000,000. John E. Searle, Francis C. Gray, Branton H. Kellogg—all of 60 State street, Boston, Massachusetts. Principal address, Chicopee Falls, Massachusetts. To manufacture and deal in rubber, gums, rubber substitutes, etc. This company has been incorporated by the Fisk Rubber Co., Chicopee Falls, Massachusetts, to take over the Federal Rubber Manufacturing Co., Cudahy, Wisconsin, which the Fisk company recently acquired.

Acushnet Process Co., Inc., April 27 (New York), \$500. Samuel Wright, Vanderbilt avenue and Forty-fifth street, New York City; Theodore F. Furness, Cunwyd, and E. K. Monnington, Land Title Building, Philadelphia—both in Pennsylvania. A corporation formed to handle New York City business of the Acushnet Process Co., of New Bedford, Massachusetts.

Acme Tire & Rubber Co., Limited, March 3 (Ontario), \$400,000. Joseph Max Bullen, of McMaster, Montgomery, Fleury & Co., 44 King street, West; Francis H. Hurley, 32 Aberdeen avenue; Harold Learoyd Steele, 437 Broadview avenue, and others—all of Toronto, Canada. To manufacture and deal in tires and rubber goods and rubber substitutes of all kinds.

Beaver Mills Co., April 22 (Massachusetts), \$500,000. President, G. Ellsworth Huggins, 299 Broadway; James F. Bacon, George A. Butman, Arthur W. Clapp, F. Chester Everett—all of 77 Franklin street, Boston; Ernest S. McLean, Framingham. To manufacture tire fabrics. Principal address, North Adams, Massachusetts.

Boone Tire and Rubber Co., The, April 17 (Delaware), \$500,000. I. V. Maclean, F. A. Maclean, C. H. Isbell—all of Des Moines, Iowa. Principal address, Des Moines. To manufacture and sell all kinds of automobile tires, etc.

Borderland Tire Manufacturing Co., The, April 6 (New Mexico), \$150,000. J. Thomas Ward, H. M. Mandeville, Gerald H. Totten, Gus Manasse, John L. Burnside, J. C. Miller and F. W. Campbell—all of Las Cruces, New Mexico. Principal address, Las Cruces, New Mexico. To manufacture and deal in automobile tires and tubes, rubber hose and all other kinds and classes of rubber goods, etc.

Brookside Rubber Works, Inc., May 4 (New York), \$25,000. John McLaren, F. B. Knowlton, and E. M. Beyhl—all of 154 Nassau street, New York City. To manufacture rubber goods.

Cut Price Raincoat Co., Inc., May 8 (New York), \$2,000. Charles Henschke and Esther Henschke—both of 214 Rutledge street, and Max Baron, 34 Sumner avenue—all of Brooklyn, New York.

Carolina Tire Co., The, April 18 (South Carolina), \$1,000. J. M. Chapman, president and general manager; D. A. Childs, secretary and treasurer. Principal address, Columbia, South Carolina.

Central Tire Co., The, March 16 (Texas), \$12,000. Grover C. Shaw, Robert S. Yantis, W. S. Magee, and Charles K. Biggs—all of San Antonio, Texas. Principal address, San Antonio, Texas. To deal in automobiles, automobile tires, and accessories.

Delion Tire & Rubber Co., Inc., April 27 (New York), \$50,000. Henry A. Ludeke and Alma Ludeke, 170 Broadway, and Ira A. Worthington, 1791 Broadway—all of New York City.

Dayton Tire Co. of New Jersey, Inc., April 19 (New Jersey), \$10,000. Nathan Schwartz, 468 Washington avenue, Belleville; Frederick D. Ransley, 532 Central avenue, and Irving G. Farmer, Walnut street—both in Newark—all in New Jersey. Principal address, 445 Central avenue, Newark, New Jersey. To manufacture automobile tires and accessories.

Ferry Tire & Rubber Co., April 24 (Delaware), \$50,000. Olive C. Ferry and Mary H. Ferry, Middleberry Center, and Leon H. Klock, Wellsboro—all in Pennsylvania. Principal address, Capi-

tal Trust Co. of Delaware, Dover, Delaware. To manufacture and deal in all kinds of rubber tires and rubber goods.

Globe Tire Service Co., April 21 (Maine), \$10,000. Horace Mitchell (president), H. A. Paul (treasurer), M. G. Mitchell and Benjamin F. Bunker (directors)—all of Kittery, Maine. Principal address, Kittery, Maine. To acquire, repair, sell, and otherwise deal in automobile tires, etc.

Hawkeye Tire Co., July 19 (Iowa), \$500,000. John T. Christie, I. V. McLean, C. B. Hextell, T. H. Dexter, and E. G. Raffensberger. Principal address, Des Moines, Iowa. To manufacture automobile tires, casings and tubes.

Louisville Tire Co., April 4 (Kentucky), \$5,000. Aaron Kern, Ruby B. Kern, A. A. Ericson—all of Louisville, Kentucky. Principal address, Louisville, Kentucky. To deal in automobiles, automobile tires, etc.

Newsom Auto Tire Vulcanizing Co., April 27 (Tennessee), \$75,000. Thornton Newsom, Louis LeRoy, L. R. Forsick, Joseph L. McLean, Jr., and R. P. Cary—all of Memphis. To deal in automobiles, etc.

Oak Rubber Co., The, April 22 (Ohio), \$5,000. John C. Goodman, Paul E. Collette, Lem H. Oberlin, John Shira, and G. W. Auten. Principal address, Akron, Ohio. To manufacture and deal in toy balloons.

Palmer Tire & Rubber Co., May 5 (Delaware), \$500,000. Herbert E. Latter and Norman P. Coffin, Wilmington, Delaware; Clement M. Egner, Elkton, Maryland. Principal address, 394 duPont Building, Wilmington, Delaware. To manufacture and deal in gutta percha and all goods made therefrom.

Pharis-Packard Tire Sales Co., The, April 15 (Ohio), \$10,000. Glen Geddis, Lillian Chope, W. H. Hill, Howard W. White, H. R. Sproul. Principal address, Cleveland, Ohio.

Plantation Rubber Importers, Inc., April 29 (New York), \$50,000. John French, Robert N. Chambers and Henry H. Graff—all of 59 Wall street, New York City.

Quick Tire Service Co., April 3 (Illinois), \$5,000. Kirk S. Miller, Earl F. Miller, Anthon Miller and Thomas H. Edwards. Principal address, 1559 Michigan avenue, Chicago.

R. and O. Tire Co., Inc., April 25 (New York), \$2,000. Charles W. Rehmann and Thomas O'Mara, 240 West Forty-eighth street, and Irene V. Rehmann, 4250 Disney avenue—all of New York City. To manufacture and repair tires, etc.

Richmond Waterproof Products Co., Inc., May 2 (New York), \$25,000. Irving Johnson, Van Duzer street; George T. Simonson, 218 Richmond Turnpike—both of Tomkinsville, New York; and Alfred Falstrault, 12 Archer Place, Jamaica, Long Island, New York. Principal address, Richmond Co., New York City. To manufacture cement, waterproof products, etc.

Savage Tire Corporation, March 8 (California), \$10,000. J. D. Spreckels (president); Arthur W. Savage (first vice-president); H. L. Titus (second vice-president); Claus Spreckels (secretary), Coronado, California; A. J. Savage (treasurer). Principal address, San Diego, California.

Southwestern Tire Manufacturing Co., March 2 (Oklahoma), \$250,000. W. A. McClelland, J. T. Wheatley, John L. McClelland, Charles W. Gunter and W. F. Westcott. To manufacture and deal in automobile tires, tubes, etc. Address, Colcord Building, Oklahoma City, Oklahoma.

Vargyas Safety Tire Co., The, May 2 (Delaware), \$100,000. Eugene Von Vargyas, Lawrence A. O'Dea, John P. Appleman—all of Washington, D. C. Principal address, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture automobile tires and accoutrements.

White Tire Co., April 19 (Kentucky), \$10,000. Charles Dobbs, B. H. Plaskett, Emil Von Allen—all of Louisville, Kentucky. Principal address, Louisville, Kentucky. To manufacture and deal in automobile tires, etc.



Young Co., A. M., March 10 (Michigan), \$40,000. Arthur M. Young, Emanuel R. Kuhn and John J. Knight. To deal in the manufacture of metal and rubber specialties. Principal address, Kalamazoo, Michigan.

#### TRADE NOTES.

Pedro Rafecas is representing Rosenwald & Weil, the well-known manufacturers of raincoats and allied products, Chicago, Illinois, in Central and South America and Porto Rico.

The Dryden Rubber Co., Chicago, Illinois, has added a general line of typewriter accessories to its output.

The Walpole Shoe Supply Co., a subsidiary of the Revere Rubber Co., has been transferred to the new building at 60 High street, Boston, Massachusetts, and now operates as a department, under the name of the Revere Rubber Co. The supply department will continue under the direction of B. F. Chamberlain, formerly manager of the Walpole Shoe Supply Co.

The Ravenna Rubber Co., Ravenna, Ohio, notice of whose incorporation appeared in the April issue of THE INDIA RUBBER WORLD, has purchased a four-story building containing about 45,000 feet of floor space and land covering  $3\frac{1}{2}$  acres to allow for future additions. The building is being equipped as a factory for the manufacture of rubber sundries. The company expects to be producing several lines by the middle of the month and to be equipped for full operation before the end of the year.

The Eureka Rubber Manufacturing Co., Inc., rubberizer of textiles for the rubber raincoat manufacturing trade, formerly of 89 Hope street, Brooklyn, New York, has moved to larger and better quarters at Fourth avenue and Eighth street, College Point, New York. Arthur C. Squires, rubber expert, has laid out the plant, to which have been added washers, mills, and a battery of five dry heat vulcanizers. The company will wash and dry crude rubber for the trade; will compound, mill and vulcanize stocks by the vapor, dry heat or open steam processes. Single and double surfaced white sheetings, auto top fabrics and transparent bathing cap fabrics will also be added to the output of the factory.

Richter & Co., Hartford, Connecticut, have obtained control of 4,200 of the 5,000 shares of the Omo Manufacturing Co., maker of dress shields, hospital sheeting and general sanitary goods at Middletown, Connecticut. The annual meeting of the Omo company was held May 17, at which the following board of directors was elected: W. C. Fisher, Russell Manufacturing Co., Middletown; Edward M. Day, Hartford; James W. DeGraff, selling agent of Omo Manufacturing Co., Plainfield, New Jersey; Ferdinand Richter, Hartford; G. Lloyd Jones, Middletown; Arthur G. Woolley, Hartford; H. M. Burr, Middletown. Later the following officers were elected by the directors: Edward M. Day, president; G. Lloyd Jones, vice-president; H. M. Burr, treasurer; T. H. Barbour, secretary.

The entire business, patents, registered trade-marks and good will of the National Cement & Rubber Co. and the New Process Vulcanizer Co., both of Toledo, Ohio, have been purchased and the entire plants removed to Cincinnati, Ohio, where in future the business will be carried on under the name of the National Rubber Specialties Co., manufacturing a large variety of cements, oils, enamels, vulcanizers, and similar goods for cycle and automobile supplies. The company's address is 4433-49 Chickering avenue, Cincinnati, Ohio.

The Columbus Rubber Co. of Montreal, Limited, is now controlled by the Canadian Consolidated Rubber Co., Limited, Montreal, Canada. A meeting of the directors of both companies held in New York City during Easter week to discuss the terms of sale of stock resulted in the purchase of 2,250 shares of the Columbus Rubber Co.'s stock by the Canadian Consolidated company, thus securing a controlling interest.

#### SUPERINTENDENT GRANBY RUBBER FACTORY.

CHARLES K. HUTCHINSON, superintendent of the Granby rubber factory of the Canadian Consolidated Rubber Co., Limited, started his business life after graduating from the high school at New Haven, Connecticut, his native city, as an apprentice in a merchant tailoring establishment, but after duly qualifying as a "knight of the needle and shears," he deserted



CHARLES K. HUTCHINSON.

that business in 1892 to become shipper in the L. Candee & Co. factory. Later he became cost clerk, which position he held for ten years, and in September, 1907, he went to Canada to become superintendent of the Granby rubber factory. When that factory was shut down three years later, Mr. Hutchinson was transferred to the head office of the Canadian Consolidated Rubber Co., Limited, at Montreal, as factory

cost accountant. In 1915 he was appointed superintendent of labor and efficiency for the company, a position which he filled with thoroughness and ability, and when the Granby factory was again opened, because of the great increase of orders for footwear, partly caused by the demands of the Canadian government for its troops sent to the European war, Mr. Hutchinson was again appointed superintendent, thus returning to the scene of his earlier success. Mr. Hutchinson in his youthful days was an active member and officer in the Connecticut National Guard, later joining the State Naval Militia, and during the Spanish-American war enlisted for active service in the United States Navy. He maintains that his military and naval experience in handling men has greatly helped him in the positions which he has held. He is receiving many expressions of congratulation on his recent transfer to Granby.

#### THE RUBBER HEEL CLUB OF AMERICA.

At the recent convention of the National Leather and Shoe Finders' Association at Richmond, Virginia, representatives of several rubber companies, which are members of that body were present and formed another association under the name of the Rubber Heel Club of America. The members of this club are: Elastic Tip Co., Boston, Mass.; Essex Rubber Co., Trenton, N. J.; Federal Rubber Co., Milwaukee, Wis.; Foster Rubber Co., Boston, Mass.; O'Sullivan Rubber Co., New York City; Panther Rubber Manufacturing Co., Stoughton, Mass., and Plymouth Rubber Co., Canton Junction, Mass. George A. Stetson, of the Elastic Tip Co., was elected president, secretary and treasurer. The full details of the organization have not yet been perfected, but its objects cover the correction of trade evils and abuses, the education of the general public in the use of rubber heels, and the general improvement of the rubber heel industry. The secretary's address is, Care of Elastic Tip Co., 370 Atlantic avenue, Boston, Massachusetts.

## TRADE NOTES.

The U. S. Rubber Reclaiming Co., Inc., New York City, is adding to its factory at Buffalo, New York, a storehouse, 150 x 150 feet, equipped with electric cranes for handling scrap, with a capacity of about 3,000 tons. Ground has also been broken for a new mill at Buffalo, which will be three stories and basement, 150 x 100 feet. The storehouse will be completed within two months, and the mill in the early fall.

We understand that W. M. Mackintosh, inventor of "Galbulose," and who has recently been connected with the Columbus Rubber Co., Montreal, Canada, contemplates starting a factory in the neighborhood of that city for the purpose of treating fabrics with his process, which renders cloth substances so treated waterproof, rot and mildew-proof, and is guaranteed an absolute repellant, and of special value at the present time for treating fabrics for army blankets, tents, ponchos, etc. Mr. Mackintosh is a thorough rubber man. He started with the North British Rubber Co. in 1880 and was with them ten years, after which he was with several Continental and European rubber factories, returning to England and later coming to this country and to Canada.

Joosten & Janssen, rubber brokers, Amsterdam, Holland, have established a branch office at 15 William street, New York City, which will be in charge of Ernest Janssen, one of the partners, and A. F. Baarslag.

The Charles Harley Co., of San Francisco, among the largest operators on the Western coast in scrap rubber and other materials, has opened a New York office in the Woolworth building. H. Greene, well known in waste rubber circles, is the New York representative.

The Berkshire Rubber Co., of Akron, Ohio, has changed its name to the Scioto Rubber Co. and is now located at Columbus, Ohio, at Fifth avenue and the Big Four Railroad. Installation of machinery is completed and the company will manufacture rubber heels, toy balloons, rubber fabric and novelties of all kinds. It is the first rubber factory to locate in Columbus.

The Republic Rubber Co., Youngstown, Ohio, has placed on the market a new black tread tire of remarkable strength and toughness. It is made of their exclusive Prodiun Process Rubber or "Prodiun." The characteristics of this new triumph in compounding are wonderful tensile strength; practical freedom from cutting or chipping on rough stony roads; remarkable resiliency; smooth wearing; heat resisting quality and light weight.

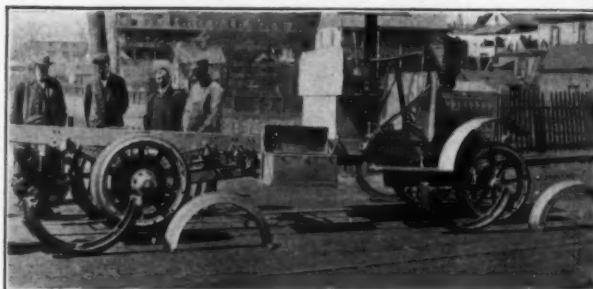
Rosenwald & Weil, Chicago, Illinois, report having sold 250,000 yards of rubber sheeting and considerably more than 1,000,000 yards of other goods within a year. This concern has recently organized a new department in the plant for calendering cloths. This is in addition to its regular business of proofing cloth for the trade and the manufacture of a regular line of men's raincoats and similar garments. This firm is rapidly establishing agencies throughout the United States for the products turned out in its establishment.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has sent to the trade an announcement, effective May 15, of a reduction of prices on its Vacuum Cup and Ebony Tread tires, claiming that although the tendency of the market in many raw materials is, in a general way, distinctly upward, the saving effected, through improvements in its new plant, resulting in a largely increased production, has enabled the company to make this change in prices. Prices on their Paruco Gray and Puregum tubes are unchanged.

A drawback allowance was granted on May 24 on dress shields manufactured by the I. B. Kleinert Rubber Co., New York City, with the use of imported silk piece goods after the same have been dyed for its account by the United Piece Dye Works, Lodi, New Jersey.

## FIRESTONE TRUCK TIRES ADAPTED TO RAILWAY TRACKS.

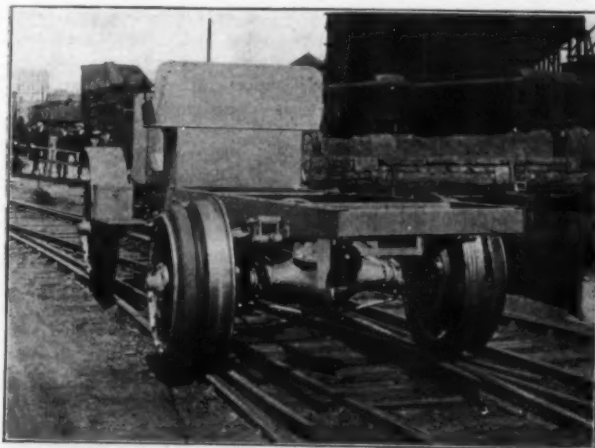
THE adaptation of the automobile to run on standard gage railroad tracks is an accomplished fact. A Riker truck, made by the Locomobile Co. of America recently ran from Columbus, New Mexico, to El Paso, Texas, 93 miles, at an average speed of 18 miles an hour actual running time, carrying 20 soldiers and



MOUNTING SPECIAL TIRE FLANGES.

a machine gun. On its arrival, the steel rims were removed and the truck proceeded on its pneumatic tires to the hotel in El Paso, where Generals Scott and Funston made a careful inspection of the vehicle. General Scott and his engineers pronounced the test to be most satisfactory. The truck left El Paso the same evening for the return trip to Columbus, which was accomplished without incident.

A number of these trucks, equipped with Firestone tires, are to be used by the United States Army in Mexico, below Cases Grandes, where Gen. Pershing controls the railroad. They are equipped with flanged steel rims, fitted over the wheels, which take the rails the same as a locomotive wheel. These rims can be carried on the truck while on regular road service, and when desirable to run the truck over the railway lines, the flanges can be fitted over the tires of the truck wheels, in 15 minutes, and the truck is ready to take the rails under its own power. The



MOTOR TRUCK MOUNTED ON RAILS.

device was invented and developed by A. L. Riker, vice-president and chief engineer of The Locomobile Co. of America. His achievement opens up a new and important field of endeavor for the gas motor truck. Mr. Riker is chairman of the Committee on Internal Combustion Motors of the United States Naval Advisory Board.

## TRADE NOTES.

Taylor, Armitage & Co., Inc., well-known dealers in tire fabrics of every description, and selling agents for the American Tire Fabric Co. and the Passaic Cotton Mills, have removed their offices from 346 Broadway to the Equitable Building, 120 Broadway, New York City.

The Newark, New Jersey, branch of the McGraw Tire & Rubber Co., East Palestine, Ohio, is being newly equipped with a 200-ton tire press and other machinery. A full stock of all sizes of McGraw tires will be carried, in both the European and new S. A. E. American types. F. B. Geary, formerly with the Kelly-Springfield Tire Co., has been made manager of this branch, succeeding W. P. Fraley. P. E. Hulick has been advanced to the position of office and service station manager.

The Fisk Rubber Co. of New York has opened offices at 11 Broadway, Bowling Green Building, for the handling of its export trade.

At the first meeting of the directors of the Hartford Rubber Works Co., Hartford, Connecticut, following the annual meeting on April 26, Charles B. Whittelsey was elected president, succeeding E. S. Williams. Mr. Whittelsey became connected with the Hartford company 15 years ago as clerk and has risen through successive stages to his present prominence. The other officers are as follows: Ernest Hopkinson, vice-president, New York City; James P. Krogh, treasurer, Hartford, Connecticut; John D. Carberry, secretary, New York City.

At a meeting of the board of directors of the Motor & Accessory Manufacturers held in New York City May 5, H. E. Raymond and C. E. Whitney resigned as members of the board. W. O. Rutherford, general sales manager of The B. F. Goodrich Co., Akron, Ohio, was elected to fill Mr. Raymond's unexpired term as a board member, as well as an executive committee member. The president also appointed him a member of the finance committee. The election of Mr. Whitney's successor was postponed. Christian Girl was made a member of the show and allotment committee.

At a recent meeting of The Motor Tire Reconstruction Co., Norwalk, Connecticut, the following officers and directors were elected: Richard Tjader, retired banker and African explorer, president and director; M. D. Randall, vice-president Mianus Manufacturing Co., Greenwich, Connecticut, vice-president and director; W. E. Goldsborough, consulting engineer, New York City, treasurer and director; R. S. B. Perry, physical director, Montclair, New Jersey, secretary and director; F. C. Goodyear, manager Royal James Inn, Norwalk, assistant secretary and director; Charles D. Burns, Secretary of State of Connecticut, and Joseph J. Ryan, son of Thomas Fortune Ryan, financier, directors.

Joseph Woodwell & Co., Pittsburgh, Pennsylvania, have arranged with the Federal Rubber Manufacturing Co., Cudahy, Wisconsin, to act as distributor of Federal tires in that territory. The Woodwell company will take care of all adjustments, thereby doing away with any possible delay. Harry Webb is manager of the automobile department.

At a recent meeting of the board of directors of the Alliance Rubber Co., Alliance, Ohio, W. H. Christensen, superintendent of the company, was elected to the board to fill the vacancy caused by the death of G. C. Russell, late president. J. C. Shiveley was elected president and treasurer, Milton Bejach, vice-president and general manager, W. H. Christensen, secretary, and John B. Pow, assistant treasurer. The Alliance company's statement to the board and stockholders of April 1 shows a 1500 per cent increase in business over the corresponding period of 1915, the chief lines of manufacture now being

automobile tires and inner tubes, although some mechanical goods are also manufactured.

The Giant Rubber Co., Carlstadt, New Jersey, notice of whose incorporation appeared in last month's issue of THE INDIA RUBBER WORLD, has begun operations in a plant consisting of a two-story building with extension covering an entire block. The factory is being fully equipped for the manufacture of various soft rubber goods, such as gloves, tubing, nipples, bags, etc., and a specialty will be made of the manufacture of inner tubes for automobile tires. For the present, the selling office of the company will be maintained at 217 Mercer street, New York City.

The Perfection Tire & Rubber Co., with factories at Fort Madison, Iowa, and offices in the Marquette Building, Chicago, Illinois, has leased the premises at 1002 Michigan avenue, in the latter city, for the distribution of its product in Chicago and northern Illinois.

The Connecticut Mills Co., Danielson, Connecticut, maker of tire fabrics, has acquired the Nemasket Spinning Mill at Taunton, Massachusetts, which will be promptly equipped for a maximum production of 6,000,000 pounds per annum, which will give that company its own spinning capacity for about one-half of its weaving production at Danielson. The strike at the latter mill, although not entirely overcome, is in process of adjustment.

The new owners of the Beaver Mills, North Adams, Massachusetts, will make a line of tire fabrics which will require much new machinery. Carding and twisting machinery from the Saco-Lowell Shops is being installed and Whittin combers. The mill will be operated in future by leased hydro-electric power from the Connecticut Power Transmission Company. The New York office of the Beaver Mills is at 299 Broadway.

## THE MICHELIN AMERICAN PLANT.

A good year's work is shown in the Michelin Tire Co.'s plant at Miltown, New Jersey, ground for which was broken on June 3 of last year, and seven of the buildings being now completed and the eighth probably finished within the present month. The plant, when completed, will have about 8½ acres of floor space and it is claimed to be the largest tire plant in America. The property consists of about 80 acres of ground on which were four large buildings which had been used by the International A. & V. Tire Co. It was decided to use these only for store-houses and offices, and the eight new buildings mentioned have therefore been built for the factory. It is stated that when this manufacturing plant is completed no visits of inspection will be allowed, this being the Michelin inflexible policy and the rule in all of his plants in France, England and Italy. Indeed it is said that at one time the Queen of Italy desired to inspect the processes of manufacture at the Turin factory but permission was refused.

## CANNOT REGISTER "NOBBY" IN AUSTRALIA.

The United States Rubber Co. was especially fortunate in its choice of the word "Nobby" as a trade-mark for one brand of its tires, inasmuch as there is a double meaning attached to the word, one meaning aristocratic or elegant and the other really descriptive of the tread, which is covered with knobs. When this company applied for registration of this word as a trade-mark in Australia the examiner objected on the ground that the word was descriptive of the character and quality of the goods, since it was commonly accepted as meaning, having an aristocratic appearance, showy, elegant, fashionable, smart. An appeal was taken to the registrar, but he sustained the decision of his subordinate, basing his opinion on the definition of the word in the Century dictionary.



## PERSONAL MENTION.

Lloyd L. Seaman has been made district representative for The Knight Tire & Rubber Co., Canton, Ohio. Mr. Seaman's territory will cover the western and northern parts of New York State, with headquarters at Syracuse.

George W. Larkin, formerly with The B. F. Goodrich Co. at its Milwaukee, Wisconsin, branch, has been placed in charge of the tire department of the Woodward Tire & Repair Co., Detroit, Michigan. The Woodward company acts as distributor of the Miller tire, and although the tire end of the business is the principal feature, a completely equipped accessory stock is also carried by this company.

J. D. Hess, Jr., is now manager of the Cleveland, Ohio, branch of the Firestone Tire & Rubber Co., Akron, Ohio, having been for three years a salesman in the Detroit, Michigan, branch.

E. D. Hensley has been appointed resident manager of the Dayton, Ohio, branch of the United States Tire Co., New York City, having been a traveling salesman for the company since 1913.

George L. Sullivan, formerly associated with a prominent advertising agency in New York City, assumes the office of advertising manager of the Fisk Rubber Co., Chicopee Falls, Massachusetts, on June 1. Mr. Sullivan's experience as advertising man for the Boston Woven Hose & Rubber Co. and later in advertising and in the establishment of agencies with the American Locomotive Co., as supervisor of branches and manager of the Chicago, Illinois, branch of the latter company, renders him peculiarly fitted for his new position. Miss M. G. Webber, who has supervised the Fisk company's advertising in the past and who has been responsible for many of its unique ideas, and George B. Hendricks, who has been in charge of the publicity department, will act as assistants to Mr. Sullivan.

E. T. Battin has been elected a member of the board of directors of the Midcontinent Tire Manufacturing Co., Wichita, Kansas.

A. S. Hetzell, formerly connected with The Knight Tire & Rubber Co., Canton, Ohio, has been appointed sales manager of The Mason Tire & Rubber Co., Kent, Ohio.

J. W. Alexander has been appointed superintendent of the auto tire duck department for the new mill which is being built at Lawrence, Massachusetts, by the Arlington Mills.

## MARATHON TIRE COMPANY CHANGES.

H. H. Replogle, formerly manager for The Marathon Tire & Rubber Co., Inc. of New York, at Omaha, Nebraska, has been made manager of sales, with headquarters at the home office of the company at Cuyahoga Falls, Ohio.

G. R. Howell, who has been representing the Marathon company in Iowa, has been promoted to the division managership at Omaha.

C. M. Folger, Southern representative for Marathon tires, has been made division manager at San Francisco.

## NEW BALTIMORE BRANCH FOR FIRESTONE.

A thoroughly complete and up-to-date branch has been established by the Firestone Tire & Rubber Co., Akron, Ohio, at Baltimore, Maryland, in the new Walter Scott building on St. Paul street at Mount Royal avenue. This branch is well equipped to care for the demands from the territory it covers, including Maryland, Virginia, parts of West Virginia and half of North Carolina. It occupies 16,000 square feet of space, 4,000 square feet being used for the offices, which are furnished in quartered oak, with quartered oak wainscoting and terrazzo floor. A garage occupies 3,000 square feet on the first floor. This is to be used for motor trucks and contains a hydraulic press of 200 tons' capacity for solid tires. B. R. Leisure, the manager, came to Baltimore from Salt Lake City, Utah, where he formerly managed the Firestone branch in that city.

## RIGHTS OF TIRE DEALERS IN NEW ZEALAND.

A litigation affecting tire importers and exporters and of interest to the tire trade generally was recently decided in New Zealand.

The Dunlop Rubber Co. of Australasia, Limited, has the sole right of manufacturing and selling Dunlop tires in Australasia and New Zealand. Certain concerns, however, imported English-made Dunlop tires into New Zealand without the consent of the Australasian company. The latter, after repeated warnings, brought suit against the importers. The Supreme Court of New Zealand held that the trading rights of the Dunlop Rubber Co. of Australasia, Limited, should be protected and issued a permanent injunction against the defendants, restraining them from selling, offering or advertising for sale any goods under the name "Dunlop" other than those made by the Australasian company. Further, the defendants were ordered to pay the costs of the litigation in addition to a substantial sum for damages.

## THE J. &amp; D. TIRE &amp; RUBBER CO.

The directors not named in the incorporation notice of the J. & D. Tire & Rubber Co., Charlotte, North Carolina, appearing in the May issue of THE INDIA RUBBER WORLD, are as follows: H. S. Leyman, Thomas J. Northway, L. A. Folger, J. D. McCullough and E. Thomason. H. O. Smith, president of the company, first entered the rubber business in 1893. He was one of the organizers of the Indianapolis Rubber Co., remaining with that company about 13 years. The Indianapolis company and one other concern were the only manufacturers of the Gormully and Jeffery tires until the G & J patents were sold and the G & J Tire Co. was organized, with Mr. Smith at the head. The other officers of the J. & D. Tire & Rubber Co. are: Thomas J. Northway, vice-president; C. C. Coddington, treasurer, and L. A. Folger, secretary.

The J. & D. company is erecting a new plant consisting of three buildings, all of concrete construction. A one-story vulcanizing room will be located between the two main manufacturing buildings. Electric drive will be employed throughout and automobile tires of the conventional types will be manufactured.

## SOME TIRE DON'TS.

The touring season being almost here, The B. F. Goodrich Co., Akron, Ohio, urges motorists to give the proper care to their tires by heeding the following:

"Don't overload your tires.

"Don't underinflate.

"Don't neglect small cuts.

"Don't run in ruts, car tracks or against curbing.

"Don't start or stop suddenly or skid around corners.

"Don't let oil, grease or gasoline remain on your tires. Wash only with pure, cold water and a little soap.

"Don't keep a spare tire out of use too long. Change over occasionally.

"Don't let your rims get rusty. Common stove polish will keep them in good condition.

"Don't let the weight rest on a deflated tire. Jack up the wheel or remove the tire.

"Don't pinch the inner tube, when applying or removing an outer casing. Pass the hand around inside before re-applying the outer bead. Don't try to force a tire onto the wheel. If it goes unusually hard, look for some trouble."

The Trainer Spinning Co., Trainer, Pennsylvania, is now producing tire fabrics, additional equipment consisting of twistors and looms having been added, and a warehouse built.

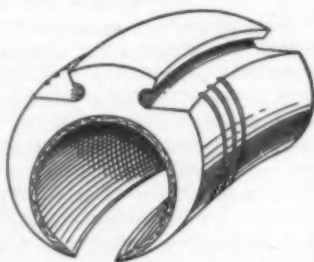
Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Machinery; Rubber Trade Directory.

## GOODRICH NEW QUARTERS AT BUFFALO.

The Buffalo, New York, branch of The B. F. Goodrich Co., Akron, Ohio, has been removed from 731 Main street, to 1050 Main street, in the building formerly occupied by the Ford Motor Co. This change of location brings the Goodrich company more nearly in the center of the automobile district and adds materially to the office space, the general arrangement of offices being such that trade can be handled to better advantage. The building is particularly well heated, ventilated and lighted, thus benefiting the comfort and efficiency of the employees, and a 2-ton elevator is a material aid in rendering prompt service. The truck tire department is exceptionally well equipped and the company is able to handle a great many more trucks per day than was possible in the old location.

## RUBBER ARMOR FOR AUTOMOBILE TIRES.

An armor or cushion intended to be inserted between the inner tube and the shoe of an automobile tire is shown in the accompanying illustration. It is claimed that this makes the tire puncture proof, non-collapsible, and that it cannot blow out, and the resilience is greater than in tires not thus provided. Besides this, being self-ventilating, the tire is prevented from heating. This device consists of a rubber cushion having a T-shaped head which presses upon the inner surface of the tire; flanks or sides of the armor which prevent the tire from collapsing, and serve as a protection for the tire and tube; and air channels which it is claimed prevent the tube and tire from heating. It is claimed that the T head prevents the tire from flattening and that it will stay at the same radius, making the running and steering of the car easier; that the tire and tube will flatten less from the weight, and that the inner tube need not be pumped up as hard as under the present system without the "Armor." [C. C. Wais, Oakley, Ohio.]



## THE LUCK PNEUMATIC TIRE AND RIM.

This is called the botherless tire, because the casing and inner tube are protected against puncture by an extra heavy rubber tread and metal side flanges. The tire itself is built very much like an ordinary pneumatic tire, with several plies of frictioned fabric, beads of the usual clincher sort and an inner tube. But the actual difference is apparent in the accompanying illustration, and the following explanation:



The sides of the tire are protected by curved flanges, one of which is shown at A, that prevent blow-outs, punctures and side strain. The body of the tire B is made up of five plies of frictioned fabric and the space C provides for the expansion of the side walls under compression. The inner tube D is very similar to those used in the ordinary casing, but of a special construction adapted to the peculiarities of the casing.

The steel flanges are bolted to the felloe E by eight bolts F that likewise hold the two flanges in place, the heavy, extra thick tread G acting as a protector to the casing, preventing blowouts, rim cuts, blisters and punctures. [Luck Tire Manufacturing Co., Jonesville, Michigan.]

## SEIBERLING, STEVENS AND STATE PATENTS VALID.

AN opinion in favor of Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., has been handed down by Judge J. M. Killits late in April, in the suit against the Firestone Tire & Rubber Co., charging infringement of the Seiberling, Stevens and State tire-making machine patents Nos. 725,135, 726,561 and 941,962. The court held the Seiberling-Stevens patents valid and that they were infringed by the Firestone company. The suit was in the United States District Court for the Northern District of Ohio, Eastern Division, at Cleveland, Ohio.

In reviewing the patents, Judge Killits found that their outstanding and unique feature was the provision of methods for taking straight fabric and so stretching and forming it that it would take a cylindrical shape.

Says the judge: None of the alleged anticipations was either intended to produce nor had the capacity to produce one important result which is one of the *desiderata* aimed at both by the patentees of the grants in suit and the defendant, namely, to lay down the fabric so that a structural rearrangement thereof would be brought about to meet most efficiently the changing direction of strain to which a tire is subjected in use, circumferential, transverse, and, to some extent at least, torsional.

That these inventions so operate to stretch the fabric circumferentially of the tire and also on the wings of the fabric, as it is being laid down, in the direction of the radius of the circumference, and that these results are highly desirable in an efficient product, no one has very effectively disputed.

In view of the working of plaintiff's Exhibit "32" in the presence of the Court, and of the testimony of Hall that this exhibit was made exactly after the detail of drawings in the Seiberling and Stevens' patent in suit, and of the product of this exhibit in practical use shown in evidence, and further, in view of the state of the art at the time the Seiberling and Stevens' application was made, we feel justified in concluding that their invention was not only the first practical invention to produce mechanically automobile tires having the qualities of service demanded in the use thereof, which qualities were peculiarly the fruit of mechanism effecting the rearrangement of cords to meet the various directions of stress, above alluded to, but that it employed therefor novel and patentable combinations of mechanical elements; that it was decidedly an advance step in the art and so far occupying the field that it anticipated in a large measure both the State and Stevens' inventions.

In fact, we regard the Seiberling and Stevens' mechanism so nearly pioneer invention that the claims of the patent grant therefor should receive liberal interpretation, and we are forced to hold that the three sued upon, Nos. "1," "2" and "14," are valid.

## BRITAIN WILL CONTINUE TIRE IMPORTATIONS.

On May 4 a further extension of British embargo lists against importation of various articles was received by the State Department at Washington, to the effect that the British Board of Trade would restrict the importation of many lines of manufactured goods, among them rubber tires and tubes for motor cars and motorcycles. The reason given for this was because of the shortage of tonnage and the necessity of restricting imports to necessities, mainly coal, grain, fuel, timber, munitions, etc. The effect of this decree, which was to go into effect May 12, upon British industry would have been serious for numerous dealers who have existed during the past year or two almost entirely by the sale of American automobiles and tires, and it was stated that if the prohibition was maintained for a year or more, several of the big London agencies would be forced to close down, causing an almost complete stagnation of highly developed British branches maintained by several American tire manufacturers. However, a later despatch states that Walter Runciman, president of the Board of Trade, has announced that motor car tires would not be included in the lists of articles whose importation is prohibited. Arrangements made with manufacturers of rubber goods in the United States led to the decision that the proposal to include tires in the embargo should be abandoned.

### THE RUBBER TRADE IN AKRON.

*By Our Regular Correspondent.*

ACCORDING to estimates of the city building department, nearly \$5,000,000 worth of building is under way in Akron, and it is estimated that factory additions alone will total over \$2,500,000 before they are completed. Even at this rate, houses are not being built fast enough to accommodate the hundreds of workers and their families who are pouring into the city every week in response to manufacturers' calls for help.

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The rate of tire output at the plant of The B. F. Goodrich Co. is now 17,000 tires daily, last year's record output being 14,000 daily.

An application for a trade-mark consisting of a tire with a black tread with red side walls has been opposed by the Goodrich company, which claims rights to a mark consisting of a black tread, intermediate to circumferential bands of contrasting color or colors, these colors being especially light gray or white. The Goodrich company also claims to have been the first to use red side walls with a black tread, and this contention has been sustained by the Examiner of Interferences.

People in various parts of the United States are familiar with the guide posts which have been erected by the Goodrich company. It is stated that this company has erected nearly 85,000 such guide posts, each individually labeled. Most of these, of course, are in the United States on principal highways, but the northern and southern national boundaries have been passed in some cases in the erection of these valuable guide posts, each of which is also a good advertisement for the company.

W. H. Yule, formerly manager of the New York branch of the Goodrich company, has been made sales manager of the mechanical department at the home office, in which capacity he will be an immediate assistant to W. O. Rutherford, general sales manager, handling the general mechanical specialties of the company in hard rubber, wire and clothing, his work paralleling that of H. C. Miller, who is sales manager of the tire department. Mr. Yule was graduated from Harvard in 1906 and has been directly and indirectly connected with the automobile industry ever since. He is succeeded in New York by H. J. Morehead, who was formerly in charge of the Detroit branch of the Goodrich company.

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F. A. Seiberling, president of the Goodyear Tire & Rubber Co., and A. B. Jones, of The B. F. Goodrich Co., were delegates to the National Conservation Congress held in Washington last month.

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A new \$30,000 library building recently opened to the students of Akron University was a gift from F. H. Mahon, of The B. F. Goodrich Co., and F. A. Seiberling, of the Goodyear Tire & Rubber Co.

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M. A. Flynn, superintendent of The B. F. Goodrich Co., and W. M. Metzler, superintendent of the mechanical goods department of the Goodyear Tire & Rubber Co., represented their respective factories at the State Convention of the Knights of Columbus held in Akron the early part of last month.

\* \* \*

The Goodyear Tire & Rubber Co. has dedicated to "The Old Guard," an organization of their old employees who were with the company when P. W. Litchfield, present factory manager, assumed charge 16 years ago, an eight-story tower carrying a huge clock, which will inform all the residents of the city of the time of day. These old employees will hold their annual dinner hereafter in the Old Guard Tower.

The annual relief association picnic of the Goodyear company will be held at Cedar Point on June 24. Eight trains with a

total of 80 coaches will be used to transport the 5,000 employees who will attend the outing.

M. E. Morris, formerly Pacific Coast manager for the Goodyear company, has been made manager of the salesmen's department of the Akron factory.

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On June 2 a meeting of the stockholders of the Miller Rubber Co. is to be held to approve the action of the board of directors to increase its present capital stock of \$2,000,000 to such amount as may be determined upon at that meeting. It is understood that if this action is taken, a stock dividend of 66⅔ per cent will be declared to the common stockholders, provided they will waive their right to subscribe to a proposed new issue of preferred stock to the amount of \$2,500,000, and to consent that the same may be sold by the directors at par, or better. The board of directors has also decided to retire all the present outstanding preferred stock at the price at which it is redeemable, namely, \$120 per share. It is stated that the proposed increase of capital is for the purpose of taking care of rapidly enlarging business, sales for the past six months having increased more than 100 per cent over the same period the previous year.

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The American Rubber & Tire Co. is erecting a two-story addition to its plant.

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In a spacious laboratory connected with the factory of the Firestone Tire & Rubber Co. and equipped with every modern device to aid in rubber research, H. W. Kugler, head chemist of the company, produces, studies and selects the ingredients and compounds that are used in the manufacture of Firestone tires and tubes. Mr. Kugler's early training especially fits him for this important work. He was born at Barnesville, Ohio, and at an early age went to England. Some years later he entered the Manchester Technical School, remaining there for four years. Immediately thereafter he spent three years as chemist with Dr. Liebman, of Manchester, and in June, 1909, became head of the chemistry and experimental department of the Firestone factory.



H. W. KUGLER.

\* \* \*

Charles E. Wood, crude rubber operator, of 24 Stone street, New York City, has opened an Akron office at room 504 Hamilton Building and will be represented there by Walter H. Bass. Mr. Bass, who is a graduate of Princeton College, has been in the employ of Mr. Wood for some time, having been connected with the home office.

### THE RUBBER TRADE IN BOSTON.

*By Our Regular Correspondent.*

WE do not find people in any branch of the rubber business complaining of lack of trade. Of course, the boot and shoe industry will now have a little lull, for the retail merchants who proposed to take advantage of the extra discount have already sent in their orders, and the jobbers have now a month during which to forward their orders previous to the expiration of the time limit. There seems to be some let-up as regards tennis orders, but all factories are still at work on goods previously ordered, and are rushing them out as fast as possible. In the clothing business trade has been unusually good, and the demand for goods for fall delivery continues to such an extent that some of the manufacturers are practically swamped with orders. Tire manufacturers are busy with more than reasonable demands. In fact, while there are some reports that the higher



price of gasoline has deterred people from buying new automobiles, it is evident that cars already in use are being run and new tires are in demand. In mechanicals, business is quite active in some departments. There is not a seasonable demand for hose, especially of the garden variety, as distributors' stocks are pretty large, last summer being a poor season for retail sales. Drug sundries are more than normally active. Belting is having a boom because of the high cost of leather, and many manufacturing establishments are adopting rubber belting experimentally, which, it is believed, will result in its far wider use, later.

The Boston Woven Hose & Rubber Co. has recently completed two fine examples of factory structures of reinforced concrete. One which will be used for additional manufacturing facilities, has four stories and basement and is 204 feet long by 60 feet wide. It has a floor area of nearly 55,000 square feet. In the center a bay extends the full length of the building in which there is a traveling crane. The other building, which is a storage warehouse for manufactured goods, has also four stories and basement and is 155 x 60 feet, the floor area being nearly 45,000 square feet. These new buildings are connected with other buildings of the factory by tunnels.

The moving picture demonstration of the workings at the Boston Woven Hose company's plant, together with the lecture delivered by Ralph E. Conder, of its advertising department, is giving this company some effective publicity. Mr. Conder has been invited to deliver this lecture before a number of clubs and educational institutions, with the result that the manufacture of rubber goods is being more widely understood and the company gains valuable advertising for the many specialties it manufactures.

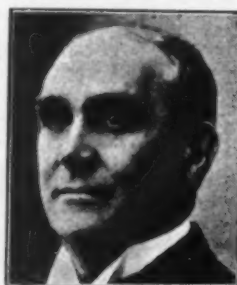
The plant and machinery of the Eastern branch of the St. Louis Rubber Cement Co., at West Lynn, Massachusetts, has been purchased by the National Adhesive Co., a Massachusetts concern capitalized for \$15,000, which is to manufacture rubber cements, stains, inks and adhesives for the shoe trade. This company will have branches in Haverhill and Brockton, Massachusetts, and in Auburn, Maine. E. F. Olson is president, E. J. Looke, treasurer, and W. O. Hadley, general manager.

The Monaquot Rubber Works Co., South Braintree, recently gave its employes a voluntary increase in wages, amounting to ten per cent. This is in line with the company's policy of sharing with its organization in the advantage resulting from general business conditions. Plans are under way for the erection, on the company's property, of model homes which will be for the exclusive use of its employes. The allotment which is being thus developed is a very attractive plot of about 12 acres lying across Monaquot Pond from the factory buildings and its situation makes it ideal for the purposes contemplated by the company.

One of the most serious labor disputes in this State this year was the strike of 2,600 employes of the Fisk Rubber Co., at Chicopee Falls, which has been happily settled. The strikers returned to work on May 22, after having been out, or at least a portion of them, since the middle of March. For some time, in spite of negotiations, a deadlock had existed and it was not until about the 20th of May that an agreement could be secured. The settlement of the strike is due in a large measure to the efforts of Frank M. Bump, commissioner of the state board of conciliation and arbitration, who secured some concessions on the part of both the striking employes and the company. The main points demanded by the workmen were an eight-hour day without a diminution of wages, time and a half for over-time, double for Sunday and holiday work, and a recognition of the labor unions. The company has granted all except the last condition. The factory is to

run on eight-hour shifts, two or three shifts, as ability or necessity demands, shift No. 1 working from 7 A. M. to 3 P. M., No. 2 from 3 P. M. to 11 P. M., No. 3 from 11 P. M. to 7 A. M., the shifts to advance their positions every fourth week. As regards recognizing the unions, the company, while not conceding this, agrees to handle questions of dispute through a committee selected from its employes. This is considered fairly satisfactory to the workmen because, all the departments being unionized, this arrangement is tantamount to recognition of the union.

Ira A. Burnham, vice-president of the American Rubber Co., who was quite ill with pneumonia early in the spring, has returned to his office fully recovered. Mr. Burnham is a veteran in the business, having been associated with the Mystic Rubber



I. A. BURNHAM.

Co. and the Hall Rubber Co. previous to the establishment of the Stoughton Rubber Co. in 1889, and his business experience in the rubber line dates back nearly 40 years. He was one of the first to discard foot power sewing machines for steam power in factory work and the first to discard the then prevalent solarizing process and introduce vulcanization in dry heaters for proofed fabrics. When the gossamer garment was displaced by the mackintosh the Stoughton Rubber Co. came to the front at once as a large and profitable manufacturer of raincoat clothing and much of its success from then up to the time of its consolidation with the American Rubber Co. this year is due to Mr. Burnham's knowledge of the business, his executive ability and his enterprise.

The Revere Rubber Co. is now well established at its new office, 60 High street, in this city, where it occupies the second and third floors of what has been named the Revere Building. Here the company has most comfortable and convenient headquarters, both for its office and sales departments and to carry a stock of goods for quick delivery. The windows in the second story, which are of plate glass, have been emblazoned with the trade-marks of the company, one window showing the handsome shield trade-mark which the company uses, depicting Paul Revere on horseback, making his famous ride, the other front windows advertising in colors and gold the "Spring Step" heel, the "Four-Ace" belt and the "Grant Stitched" belt. The rooms are well arranged, there being special private offices for W. D. Rigdon, manager of the New England sales department in the mechanical line, and J. H. Learned, manager of the rubber thread department. Here also are the accounting department, sales rooms and desk rooms for the accommodation of salesmen and customers. Above, on the third floor, are the offices of B. F. Chamberlain, manager of the shoe supply department, and Fred T. Ryder, manager of the sole and heel business of the company. These offices are very convenient for customers, being not far from the shoe center and in the immediate vicinity of the machinery and plumbing supply trades.

At a hearing on May 15 the receivers of the B. & R. Rubber Co., North Brookfield, Massachusetts, were authorized by the court to sell the plant of the company if they deem such a course necessary.

The Revere Rubber Co. will erect a one-story brick building for the manufacture of rubber cement at its factory at Chelsea.

**THE RUBBER TRADE IN RHODE ISLAND.***By Our Regular Correspondent.*

THE month of May opened with several of the rubber factories of Rhode Island struggling with labor troubles, some with strikes on their hands and others threatening. Fortunately, however, these were settled in the majority of instances by increasing the wages to meet the demands of the operatives. Few, if any, of the plants have sufficient help to get out the large orders on hand, and to allow any of the operatives to go would be a serious handicap at this time.

The rubber mills throughout the State have had more than a year of unusual and in some cases unprecedented prosperity, and despite the high price that has had to be paid for crude rubber, as well as nearly all of the supplies needed in the industry, it is believed that the profits have kept up with the times, and have been large enough to warrant sharing them with the employees. All of the plants are working full time, or better at present and the heavy demand for goods, especially shoes, that has been noticed for many months past, continues.

The declaration of strikes among the rubber workers was rather unique in labor matters from the fact that they followed the voluntary and unexpected announcements on the part of the concerns of a general increase in wages that affected upwards of 7,500 rubber workers in Woonsocket, Bristol and this city. The first announcement of any increase came from the United States Rubber Co., affecting its mills and subsidiaries, and was quickly followed by other concerns.

On April 27 LeBaron C. Colt, vice-president and general manager of the National India Rubber Co., Bristol, caused notices of the increase to be posted to take effect on May 1. In the notice Mr. Colt said that the company had voluntarily decided to make the advance in wages, but that the exact amount of the increase would not be known until the new schedule had been figured out.

Notices were also posted in the Woonsocket and Millville mills of the Woonsocket Rubber Co. These stated that, as in the past few months, there had been certain increases in day and piece-work prices, commencing May 1 there would be an adjustment and increase of certain other piece-work prices.

As soon as the announcement had been made public of the advance in the Woonsocket and National plants, the Bourn Rubber Co. in this city announced that it would follow the lead of the larger concern and would give an increase to the men, making the same kind of goods that are made in the factories of the United States Co.

The wages of the employees of the Narragansett Rubber Co. at Bristol were also advanced, Terrence McCarthy, the owner and manager, announcing that the new schedule was made to meet the increase in other rubber mills of the State, either on day work or piece-work.

LeBaron C. Colt, vice-president and general manager of the National India Rubber Co., at Bristol, died last week, the result of an automobile accident, on the night of May 18. With Mr. Colt were Albert S. Chesebrough, a yacht designer of international note, and nephew of the famous yacht builder Nathaniel G. Herreshoff, and Col. Luke H. Callan, Superintendent of Highways of the town of Bristol. The machine skidded and plunged down an eight-foot embankment into Narragansett Bay. Mr. Chesebrough was instantly killed. Col. Callan escaped severe injury, and rescued Mr. Colt who had been pinned beneath the machine. It was believed that while Mr. Colt's injuries were severe he would certainly recover, but pneumonia set in and he succumbed one week after the accident.

The Manhasset Manufacturing Co., Putnam, Connecticut, of which Roland H. Ballou of Woonsocket is treasurer, is soon to

open the addition to its plant which has been under construction for two months, and which will nearly double the output of the plant. The company makes automobile tire duck and is running night and day, and according to Superintendent A. D. Lown, will continue for some time to do so.

The company intends starting work soon on six new dwelling houses for operatives. These will hold three families each and will probably be located on land just south of the recent addition.

The Tire Shop, Romeo A. Bonin, proprietor, has removed from 127 Court street to its new and larger quarters at 143 Court street, Woonsocket, where a tire repairing shop fitted up with the most modern appurtenances has been installed.

The Narragansett Rubber Co. at Bristol is having a new elevator for handling freight set up in the mill. Several of the departments in the plant are being operated nights.

Rapid progress is being made in the erection of additions to the north part of the mill of the National India Rubber Co. at Bristol.

Dr. Edward B. Knight, secretary of the New England Butt Co., Providence, died at his home, 366 Broadway, that city on May 8, of heart trouble. He had been in ill health for several years and about three weeks previous to his death his condition became very grave. He retired from medical work about 14 years ago, but prior to that time he had established an extensive practice. He graduated from Harvard Medical School in 1867. He had been secretary of the New England Butt Co. for several years and his son, Russell W. Knight, is treasurer of that concern.

**THE RUBBER TRADE IN TRENTON.***By Our Regular Correspondent.*

THE John E. Thropp's Sons Co. is steadily increasing its rubber machinery export business. A tire making machine was recently shipped to the Paris Rubber Co., Paris, France. Another shipment of molding and wrapping machines was sent to a concern in Lyons, France. A plant in Argentine Republic for the manufacture of tires was recently completely equipped by this company. Among orders in the Thropp shop now in process of completion is one for the new tire making plant of the Brunswick-Balke-Collender Co. They are also completing the equipment for the new Zee Zee Rubber Co.'s plant in Yardville, New Jersey.

Fire which started in the drying room did \$20,000 worth of damage to the plant of the Delion Tire and Rubber Co. A watchman who discovered the blaze made ineffectual efforts to extinguish it. A nearby volunteer fire company responded but the blaze gained rapid headway and it was necessary to call on the Trenton department for aid. The factory is in Hamilton Township, just outside of Trenton. When the engines arrived from that city the building had been practically gutted. The work of reconstruction was at once taken up and the plant, equipped with new machinery, will be in operation shortly.

The rubber sundries plant of Gropp & Gedney was damaged to the extent of \$1,000 by a fire of unknown origin. Most of the damage sustained was to equipment and supplies.

Plans are under way for a great industrial show in the Trenton armory in October. A big rubber show will be part of the affair if the plans are carried out. Among those on the general committee to arrange for the show are J. Cornell Murray, of the

Empire Rubber & Tire Co., and Alfred Whitehead, of the Whitehead Brothers Rubber Co.

#### WESTERN NOTES.

**T**HE Macandaruba Elastic Tire Filler Co., Inc., a \$25,000 corporation manufacturing a patent tire filling composition, is building a factory at Oakland, California, 40 x 111 feet in dimensions. With the present equipment tires can be filled for 20 cars per day. This company has its main factory at 1722 Fairmount avenue, Philadelphia, Pennsylvania, is now operating in the Central Western States, Illinois and Indiana, and intends entering Oregon and Washington also. J. H. Copeland is the inventor and patentee of this tire filler, which is claimed to be a panacea for tire evils such as punctures, blow-outs and rim cuts.

\* \* \*

The Peters-Tucker-Hay Rubber Co., Denver, Colorado, whose incorporation was noted in the May issue of THE INDIA RUBBER WORLD, has the exclusive agency for the Knight and Blackstone tires manufactured by the Knight Tire & Rubber Co., Canton, Ohio. H. G. Peters, president, was formerly treasurer of the Boss Rubber Co., Mr. Hay and Mr. Tucker also being connected with that company.

\* \* \*

The St. Louis Rubber Manufacturing Co., St. Louis, Missouri, has changed its name and location and will hereafter be known as the Bunker Hill Rubber Works, Bunker Hill, Illinois.

\* \* \*

The Portage Rubber Co., Barberton, Ohio, has established a new branch on the Sheridan Road, corner of Broadway, Chicago, Illinois, a point passed by practically every automobile going out of Chicago to the north, and therefore a convenient location for many users of its tires.

\* \* \*

The B. F. Goodrich Co., Akron, Ohio, has established a wholesale stock depot at 406 Myrtle avenue, El Paso, Texas, which will be a dealers' service station, designed to facilitate delivery of supplies and to work for the dealers' interests. C. K. Chapin will be in charge.

\* \* \*

The United States Rubber Co. of California, Los Angeles, has recently moved into a new building at 923 South Los Angeles street, which allows space for carrying and handling a much larger stock than in the old location. The new building is three stories high, with 90 feet frontage and 175 feet depth. In addition, the company has a separate building, approximately 40 x 75 feet, devoted exclusively to solid tires.

\* \* \*

Richard Leigh, a well-known Eastern rubber man and tire expert, has been made general manager of the Dry Climate Tire Manufacturing Co., Denver, Colorado.

#### SAVAGE TIRE CO. EXPANSION.

The Savage Tire Co., San Diego, California, has been growing very rapidly during the last year, and is now manufacturing about 250 tires per day, as compared with 75 a year ago. The capitalization has recently been increased to \$5,000,000, and it is predicted that within a short time the output will be 700 to 1,000 tires daily.

The Savage company is also planning for distribution of its tires all over the United States. Branch stores have been opened in Chicago and New York, the former branch controlling the middle West, distributors having already been appointed at Kansas City and St. Paul, while the New York branch will look after the distribution in the Western and New England states. A number of additional distribution points will also be arranged for through the South.

#### AN INTERESTING EXHIBIT OF BRAZILIAN PRODUCTS.

**D**R. EUGENIO DAHNE is a man of action. He generally accomplishes what he plans to do or knows the reason why. His remarkable work in exploiting Brazil and its products at world's fairs and rubber exhibitions is well known to our readers, as is also the exhibit he has arranged at the Panama-California Exposition at San Diego. Mention was made in our April issue of the departure of Dr. Dahne for Brazil to secure more exhibits, and the prediction made that he will come back with much rubber, coffee and a great variety of interesting Brazilian products.

It must not be inferred, however, that the Brazilian exhibit at San Diego is not already a well-arranged and important



PART OF THE BRAZILIAN EXHIBIT AT SAN DIEGO EXPOSITION.

one. Some pictures of the exhibit, as arranged at the opening, were shown by us in September, 1915, and certainly these gave a good idea of its size, scope and seeming completeness. Dr. Dahne, however, was not satisfied, and plans even more comprehensive exhibits. The picture on this page gives an excellent idea of the products of Northern Brazil, exhibiting rubber, forestry and game. The approach to this department is through a long aisle, on one side of which are shown the products of Central and on the other those of Southern Brazil. The main attraction of this department is a representation of a rubber gatherer's house. This is decked with trophies of the hunt, skins, clubs, bows and arrows, while behind and above is a large map of the Republic of Brazil and the columns are festooned with national flags of the Republic. At the other end, but not showing up well enough to reproduce in this picture, is a representation of a South American jungle with growing plants brought from the tropics, this natural verdure being backed by a huge painting of a Brazilian forest. Here also is a rubber gatherer's hut, with the usual tools and implements used in the gathering and smoking of rubber. There are specimens of every kind of rubber produced in the country, cases of rubber seed, and small rubber trees growing in pots, and the walls are covered with large photographs illustrating the various steps from gathering the latex to shipping the crude rubber.

It will thus be seen that this department and the exhibition of some five tons of different varieties of rubber which are arranged at the approach to this special department well represent the rubber industry of Brazil, and that if Dr. Dahne brings with him on his return still further additions, it would seem as though this exhibit would be the most complete of any ever shown of Brazilian rubber.



## The India Rubber Trade in Great Britain.

*By Our Regular Correspondent.*

### IMPORTED RUBBER TIRES.

IN the April issue of THE INDIA RUBBER WORLD it is stated that the British duty on rubber tires is 33½ per cent ad valorem; it should be noted, however, that although this duty was proposed it was subsequently abandoned. There is a general feeling among manufacturers and among workmen engaged in tire making works that a heavy import duty should be levied or even total prohibition ordered. No tires, of course, are coming from enemy countries, and the only imports which really count are those from the United States. Business is still being done in well-known French makes and this introduces complications, which those who are clamoring for legislation on the matter do not perhaps sufficiently take into account. It is not unnatural that the very great increase in the business done with America should be somewhat resented by home manufacturers who, owing to being engaged at present on special government work, are handicapped in competing with those American firms who are continually extending their activities in Great Britain. From the tone of the most recent parliamentary Board of Trade reply to a query on the subject, I think it is not at all improbable that the present American imports will be affected in the near future, not by the imposition of a heavy duty, but by an extension of the restricted imports order, to include motor and cycle tires. It must not be overlooked, however, by those advocates for protection, who are now so prominent in numerous branches of trade, that not all the imported tires are used for pleasure motoring, and that it might prove to our disadvantage at the present time, with the increasing labor shortage and other trials, to have to depend practically entirely on the home output.

### THE PROOFING BRANCH.

Beyond the work on existing government contracts there is no great activity in the trade, home trade being decidedly slow, as is also new foreign business. Large government orders for certain goods which have been on the tapis for some time, have not yet matured, owing, it is said, to differences of opinion as to the quality and price which, in the case of straightforward manufacturers, always synchronize. A discussion as to what constitutes a weatherproof or a waterproof, which has been going on in some trade papers, is not without importance, and although I am not aware of any legal decision on the point, I may say that it is the opinion of leading men in the rubber trade, that a waterproof garment means one proofed with rubber, while a showerproof or weatherproof indicates cloth which has been chemically treated so as to repel rain, but has no impermeable layer of rubber. If the term "mackintosh" was universally used for a rubberized garment—to use an Americanism not favored in this country—it would simplify matters; but outside of one large firm, there is no very general disposition among manufacturers to limit themselves to this term. It is contended that "weatherproof" applies to both rubbered and non-rubbered goods, while showerproof does not, but in the present unsettled state of definition, purchasers had better ask for rubber or non-rubber goods and see that they get what they want.

### THE GARMENT WORKERS' STRIKE.

The strike of members of the United Garment Workers Society still continues at the works of the Premier Waterproof and Rubber Co., Limited, Manchester, the firm having declined to offer more than 10 per cent advance in wages. The advance of 40 per cent and more demanded has been conceded by other local manufacturers. Advances, it may be said, have been pretty continuous at various works since the war began, a good deal depending on the exact class of work, and thus it happened

in more than one case that when the secretary of the Workers' Society put his demand before a firm, it was discovered that the firm was already paying practically the whole advance requested and was naturally disinclined to quarrel over the trifle that remained to be either granted or refused. The strike at the particular works mentioned has, it should be stated, by no means paralyzed the business, because only the makers-up, and not the proofers, are affected; and, further, there has been no strike among the hands employed on government work, as these come under the supervision of the Ministry of Munitions, which has the emergency power of proceeding severely against absentees from work. Other branches of the work's business also continue in full swing. This increase in garment workers' wages must fall eventually upon the purchasers of waterproofs, though the question of a rise in price is complicated, because the present agitation is confined to the Lancashire district, and does not include the Scottish and London districts.

### DISABLED SOLDIERS EMPLOYED.

H. L. Rothband, of J. Mandleberg & Co., Limited, has been prominent in a scheme for finding regular employment for disabled soldiers, several of whom are now employed in these works. Although the firm, of course, is well known as rubber proofers, it has always done a large business in rain and showerproof goods. One of the latest developments at the works is the dyeing and rainproofing of worsted dress serges by the "Silco" process whereby the goods, it is claimed, will not shrink, cockle nor spot.

### AMERICAN RUBBER BOOTS PREFERRED.

Officers who have experienced the discomforts of waterlogged trenches during the past winter, speak highly of the rubber thigh boots known as "Bullseye" made by the Hood Rubber Co. These are retailed to them at 35 shillings a pair. They have very thick soles, and are rather clumsy, but they are said not to slip and for this reason are preferred to others of British make of more presentable appearance but having thinner soles.

### RECLAIMED RUBBER.

An article on "Regenerated Rubbers," which appeared recently in the "Gummi Zeitung," is especially interesting at the moment, as evidence that a country considered preëminent in chemical knowledge has not yet learned the way to treat waste rubber to the best advantage. Her source of supply from Great Britain and America having been cut off, she has had to fall back upon Continental products, made in either Germany or Austria, and perhaps the Scandinavian countries. Analyses and comparative prices of various Continental regenerated rubbers, or reclaims as we call them in England, are given by the author to show how far away the price is from indicating actual value. The writer goes on to say that it is amply evident that the market is sorely in need of adjustment. He has little to say in favor of Continental makes of reclaimed rubber. It is a well-known fact that in pre-war times considerable quantities were imported into Germany from Great Britain and America. It was thought that the loss of this business would be severely felt, but both countries have found that it has been quite made up by new home business. This transference of trade from foreign to home account is a considerable help to the reclaimer, through the saving of freights and credits. It seems hardly possible that the article was written by a practical man, otherwise the products of this country would have been bracketed with those of the United States, as our manufacturers here can and do produce reclaimed rubbers in no way inferior to the best

American makes, this statement being borne out by the fact that the production here for many years past has been advancing by leaps and bounds, exports prior to August, 1914, going to all countries having rubber works. Great Britain, of course, is indebted to the United States reclaimers for having been shown how to produce reclaims at a competitive price and quality, and also to United States manufacturers for showing how it can be used in quantities. Now the pupils claim to be equal to their teachers and the trade here looks forward to the future with confidence, as, however low the price of their rubber may be, the cost of waste must be in proportion, and so enable the reclaimer to put his products on the market at corresponding prices.

#### TRADE MEMORANDA.

Since the death of Mr. Openshaw, the proprietor of the Holt Town Rubber Co., Limited, Holt Town, Ancoats, Manchester, manufacturer of reclaimed rubber and rubber substitutes, this works has passed into the hands of Laughton & Son, who carry on a similar business near Manchester.

The Alpertown Rubber Works at Wembley, near London, which has now been closed down, was a reorganization of that ill-fated rubber boom concern, the Crude Rubber Washing Co., Limited. On the failure of the original enterprise, whose factory was in London, the Alpertown concern started to manufacture tires and other mechanical rubber goods, with the above-mentioned result.

Thomas Lilley, whose death was recently announced, was a partner in a large wholesale boot and shoe business in London, but became prominently connected with the rubber trade some years ago as chairman of directors of the Premier Waterproof and Rubber Co., Limited, of Manchester, when the works were taken over from a former private company.

The annual meeting of the Society of Chemical Industry is to be held in Edinburgh, where a new section was formed last year. I may mention that the local secretary of the section is B. D. Porritt, chief chemist of the North British Rubber Co., and as he will be responsible for the organization of the proceedings, it is probable that members who are ignorant of the rubber manufacture may have an opportunity of seeing something which will interest them.

Sir F. H. Smith, Baronet, chairman of Charles Macintosh & Co., Limited, has been appointed on the Board of Trade Committee appointed to consider the position of the British textile industry after the war. This is owing to the fact that he is now and has been for many years actively associated with the staple Lancashire industry.

Among the most recent enemy firms to be wound up is the New York-Hamburg India Rubber Co., Limited, presumably because the Hamburg element predominates over the New York.

Lindsay and Williams, Limited, at whose works an explosion of naphtha was mentioned a few months back, are now moving their business to larger premises at Bennett street, Ardwick, Manchester.

#### OTHER BRITISH NOTES.

THE conclusion of Justice Peterson in the Chancery Division, Manchester, in the action of Cohen and another v. Fidler & Co., in which both parties claimed the use of the word "Regent" as a trade-mark for waterproof clothing, was to the effect that the plaintiffs had established a reputation for their goods under that name prior to the time when the defendants commenced to use the word, and that its use by the defendants was calculated to mislead. He therefore granted injunctions and dismissed the defendants' motion, with costs.

#### THE NEXT LONDON RUBBER EXHIBITION.

The announcement has been made that the Fifth International Rubber and Allied Industries Exhibition and the Second International Cotton, Fibres and other Tropical Products Exhibition

will be held in London in May or June, 1919, under the same direction as the previous exhibitions, A. Staines Manders, organizing manager and Miss D. Fulton, organizing secretary.

#### DR. WILLIS NOW IN ENGLAND.

Dr. J. C. Willis, having resigned the directorship of the Botanical Gardens at Rio Janeiro, has returned to England, and is now living at Beechcroft, Clarendon Road, Cambridge, where he is devoting his time to botanical work. It will be remembered that Dr. Willis when in the Far East was director of the Royal Botanical Gardens at Peradeniya and editor of the "Tropical Agriculturist," published at Colombo. Dr. Willis writes that he does not expect ever again to have much to do with rubber, though he will always be interested in the progress of the rubber planting industry.

#### CHANGE STYLE OF FIRM NAME.

The firm of Ritter & Hankin, 27 Mincing Lane, London, E.C., England, have sent out notices to the trade that they have decided to alter the name of the firm to Geo. Hankin & Co., the change to date from the first of May. There is no alteration in the general conduct or constitution of the firm, which will be continued as heretofore.

#### A ROYAL DOCUMENT.

The North British Rubber Co., Limited, Castle Mills, Edinburgh, Scotland, has been made by special appointment supplier of pneumatic and other tires and general rubber goods to His Majesty, King Alphonso XIII of Spain. A reproduction in



miniature of the diploma or certificate of appointment is shown upon this page and will be examined with some interest and curiosity. We understand that this company has equipped a royal automobile with clincher tires.

#### SEIZED RUBBER CONDEMNED.

The British Prize Court has condemned both the ship "Sul-danha Da Gama" and her cargo of rubber, which was seized just off the south-east corner of Iceland and taken to Kirkwall, March 6. The testimony was that this ship sailed from Para on February 6 and all the documents and papers, bills of lading, invoices, etc., were for New York. No tidings were received from her

prior to the seizure, off the coast of Iceland, as absolute contraband. The captain, who was the owner of the ship, explained his being in that location by claiming that his ship needed repairs which could be done cheaper in Norway than in New York. Afterwards he claimed that the price of rubber in New York had fallen, and therefore he decided to take the cargo to Norway in hopes of better returns. The president, in giving judgment, said there was no question that the real destination of the cargo was Germany, and that the ship was carrying contraband, and also was sailing under false colors, and therefore both ship and cargo were condemned as a lawful prize.

On May 23, the Prize Court condemned 1,400 parcels of rubber which were taken from the first-class mails on the Dutch steamer "Gelria," while she was on her way from South America to Holland. It was claimed that these parcels were destined for Germany. This is one of the instances where mails from neutral countries and on neutral vessels have been examined and seized by the British, a practice which is the subject of a note of protest sent to London by the United States Government last month. The British Attorney-General, in presenting this case, pointed out the fact that such seizures had laid the government open to criticism by neutrals on the ground that it was a violation of the Hague Convention, but he declared that it should be realized by neutral governments that there had been in this case an attempt, on a very large scale, to use the shelter of the Hague Convention to smuggle contraband goods into Germany.

The decision of the Court was that the parcels in question had been dishonestly sent by post as though they were postal correspondence, and that under the Hague Convention it was expressly laid down that postal correspondence should not cover and include parcels.

#### THE RUBBER TRADE IN GERMANY.

*By Our Regular Correspondent.*

THE situation here has not improved since I last communicated with you and, generally speaking, it cannot be said that either trade or industrial conditions are brilliant. Concerns that have government orders are fairly busy but those who have not this good luck find time for meditation. The domestic trade in rubber and rubber substitute articles is very slack as is also the trade we have been doing with adjacent neutral countries. The building trade is practically dead and shipping, limited to the Baltic since the outbreak of the war, is becoming more and more restricted.

The economic relations between Germany, the Balkans and the Near East which have been widely discussed in commercial and industrial circles here, are not measuring up to expectations. In spite of our enemies' blockade we have been able to continue to do business with all parts of the neutral world, but of late this trade has become so restricted that it hardly is worth mention. Our fiscal year comes to an end March 31, and this date is always preceded and followed by a slack period in business activities. This year, however, this state of trade industry cannot be attributed in any wise to the inventory period but to conditions created by the war.

#### RUBBER TRADE WITH THE ORIENT.

Prior to the war we did a good business in rubber goods with the Balkan States, Turkey and Persia. After the government placed an embargo on rubber exports the demands of these markets continued to be supplied to some extent from stocks of goods manufactured before the outbreak of the war and with substitute qualities. Of course this business was small, but it was very welcome under the circumstances, in spite of the difficulties of exchange that always mark Oriental trading. This small business is now practically dead, notwithstanding the opening up of direct communications which was accomplished last year.

#### RUBBER INDUSTRY.

Our rubber industry is in no better condition than other branches of trade or production. Manufacturers who are making tires and other supplies for the army and navy are fairly busy, but not working under as high pressure as they were last year. Crude rubber grows scarcer and more expensive, and is now available for use only on government contracts. By mixing what crude rubber we can obtain, with synthetic rubber and rubber substitute our mills are managing to meet the demands of the military administrations. Goods for private use containing crude rubber are distributed only by special permit which is allowed only in exceptional cases.

For compounding ingredients we are not so badly off, but prices are exceedingly high. Solvents are plentiful and their prices continue to be regulated by the Government.

#### LEATHER SUBSTITUTES.

Many of our rubber manufacturers are finding a profitable occupation in the manufacturing of leather substitutes. Leather has become so scarce, and its price so high, that it cannot be used extensively for other than military purposes. Further its use is restricted by government decrees. The state of affairs has created a considerable demand for substitutes made from various compounds which our rubber industry has created.

#### MECHANICAL GOODS.

Outside of the demands of the military, and of the industries working under government contracts, little or nothing is being done in mechanical rubber goods, if these, as now manufactured, can still be called rubber goods.

The shortage of necessities of life, especially grain, has led to further restriction of the brewing industry, which was one of the best customers of our manufacturers of mechanical rubber goods. We are importing important quantities of beer from adjacent neutral countries, especially from Denmark, but have sold but little mechanical rubber goods to these neutral countries. The fact is that it is better so, for the qualities we are now producing would surely hurt the good name of German rubber goods.

The "Gummi Zeitung" in a recent issue published two clever cartoons reproduced from an English paper. One represents John Bull joyfully welcoming a ship loaded almost to its topmasts with American automobile tires. The companion picture depicts his gloom as he shows his empty pockets, while the ship is sailing homeward to the United States, stacked high with British gold. Commenting on this, our leading trade publication



says that we are better off than the British, in spite of our lack of raw materials. We are manufacturing our own tires, and doing what the cartoon advises, keeping our gold at home.



## Rubber Planting Notes.

### RUBBER PLANTATION COMPANIES' REPORTS.

RUBBER plantation companies' reports recently published, show that successful results are general. A notable feature is the reduction in all-in costs. Among other instances of excellent financial results are the following: The Sungei Way (Selangor) Rubber Co., Limited, 52½ per cent dividend; the Udalage Tea & Rubber Co., Limited, 35 per cent; the Peacock and Nilambe Tea & Rubber Co., Limited, 12 per cent; Dimbula Valley (Ceylon) Tea Co., Limited, 35 per cent; Pantiya Tea & Rubber Co., Limited, 30 per cent; Hingurugama Tea & Rubber Estates, Limited, 24 per cent; Kepong (Malay) Rubber Estates, Limited, 75 per cent. The Anglo Malay Rubber Co., Limited, is raising its dividend from 32 to 60 per cent for the year, the Cheronese Estates Co., Limited, from 15 per cent to 20 per cent, and the Mahawale Rubber & Tea Co., Limited, from 27½ to 60 per cent. The Seafeld Rubber Co., Limited, paid a final dividend of 65 per cent, compared with 45 per cent for 1914. The Pataling Rubber Estates, Limited, report 225 per cent dividend for 1915 against 175 for 1914 and the Selangor Rubber Estates, Limited, have declared a 165½ per cent dividend.

Generally speaking, shareholders in rubber plantation companies have good reason to be satisfied with the present results, and the prospects for the future are certainly promising.

### ACETIC ACID VERSUS OTHER RUBBER COAGULENTS.

Kelway Bamber, chemist, Ceylon Department of Agriculture, has recently visited Java, Sumatra, and the Federated Malay States. In the course of an interview granted to our contemporary, the "Ceylon Observer," he said that he was pleased with the growth of trees on rubber plantations in the Malay States. He was, however, of the opinion that thinning out was not done early enough, especially in the case of the older trees. Where thinning out had reduced the number to 80 or 90 trees per acre, at a reasonably early stage, he noticed that the yield had improved. He was much interested in the vulcanizing experiments being carried out by Mr. Eaton at the Experimental Station at Kuala Lumpur, and considered as especially valuable those relating to the time of vulcanization. The cost of acetic acid has risen enormously, both in Java and in the Federated Malay States, with the result that other coagulents are being recommended. He believed estate superintendents should be warned against using various coagulents, as many of them have been shown to considerably affect the time of vulcanization. In Mr. Bamber's opinion the fact that rubber manufacturers were accustomed to rubber coagulated with acetic acid made it a mistake for plantations to ship rubber, even of a better appearance, which might upset compounds and possibly cause the spoiling of manufactured goods, in which case there would result a feeling of distrust among the manufacturers which might influence prices of all plantation rubber.

### RUBBER PLANTATIONS IN FRENCH COCHIN CHINA.

The following table showing the extent of rubber plantations in French Cochin China, has been compiled from data recently published in the "Annales des Planteurs de Caoutchouc de l'Indo-Chine," the official quarterly bulletin of the Rubber Planters' Association of Indo-China:

Name of Province	Acreage Under Rubber	Number of Trees Planted
Giadinh .....	7,806	1,157,656
Bienhoa .....	13,206	1,447,200
Baria .....	3,610	362,075
Hatien .....	618	100,005
Tay Ninh .....	3,494	436,000
Thudamot .....	10,181	1,242,986
Total .....	38,915	4,747,922

### A NEW BULLETIN ON RUBBER TAPPING.

The Federated Malay States Department of Agriculture has published a bulletin on "The Tapping of the Para Rubber Tree," by E. Bateson, which contains much of interest to those who study the technical problems connected with rubber tapping.

The investigations covered in this publication are divided into six main sections, dealing with the effect of tapping on the starch reserves, lateral transport of food in bark, tapping systems, theory of tapping and, finally, a section on "some practical considerations as regards the effect of tapping on the starch reserves." The conclusion reached by Mr. Bateson is that "if any depletion of the starch reserves is caused by tapping, it is small in amount and temporary in duration." He rejects Fitting's suggestion that an examination of the starch reserves would be a useful method of determining when trees are ready to be retapped after the whole of the original bark has been removed, believing that "such examinations are unnecessary and that the thickness of the renewed bark forms a perfectly safe criterion."

Regarding the effects of leaf change upon starch reserves, Mr. Bateson considers the facts elicited by his research somewhat too meager, on account of the small number of trees examined, to enable precise conclusions to be drawn on the points of theoretical interest. He believes, however, that in the Federated Malay States the effects of wintering are spread over such a long period that they merely form part of the general problem of devising a method of tapping, which, over a period of years, will not be so exhaustive to the tree as to check its full and natural development.

In his tapping experiments Mr. Bateson describes only three methods; the single-quarter system with two cuts on one quarter, the adjacent quarter system with one cut on each of two quarters; and the opposite quarter system with one cut on each of two quarters. He found that the bark of trees tapped by the adjacent quarter system contained more starch than the bark of the trees tapped differently, and that the thickness of renewing bark was greater. As to rubber yield, the single quarter system was 16 per cent better and the adjacent quarter system 31 per cent better than the opposite quarter system, while the adjacent quarter system yielded 13 per cent more than the single-quarter system of tapping.

Mr. Bateson is of the opinion that if trees growing in a soil of average fertility are allowed sufficient space, four years will be found quite adequate for bark renewal.

### AREA UNDER RUBBER IN COORG, BRITISH INDIA.

According to the official "Report on the Administration of Coorg, 1914-1915," the total area under rubber in that province of British India is 3,367 acres.

### TIRES IN SOUTH AFRICA.

It is reported that the Dunlop Rubber Co. (South Africa), Limited, has received a repeat order from the South African Union Government for 350 pairs of motorcycle tire casings, for use with the machine-gun section for further operations in German East Africa.

### Number of Trees in Bearing in—

	1915	1916	1917	1918	1919	1920
1915	78,300	196,700	430,300	683,066	858,442	1,103,524
1916	134,000	343,000	745,000	928,000	1,117,500	1,433,200
1917	4,000	21,000	76,500	129,627	309,914	361,075
1918	1,200	5,500	18,000	44,000	80,000	100,000
1919	15,000	60,000	205,000	426,000	440,000	436,000
1920	162,000	208,995	412,365	659,831	773,147	1,210,737
Total	394,500	835,195	1,887,165	2,870,524	3,579,003	4,644,536

## THE WIDE PLANTING OF RUBBER.

THE Department of Agriculture of the Federated Malay States is doing good work in inducing the native planters to adopt modern ideas in growing rubber. It has recently caused to be translated and printed in Romanized Malay a paper on the thinning out of rubber plantations, which is being circulated for the benefit of native holders of small plantations. The subject treated in this paper is one of the most important affecting small holdings in the Malay Peninsula where rubber trees were first planted very close together, generally 10, 12 or 14 feet apart. Experience has proved that such plantings were much too close. Most of the large estates with closely planted areas are beginning to thin them out, to reduce the total number of trees to about 100 per acre.

The paper above referred to advises that in planting new areas, distances apart should not be less than 20 feet, which would total but 108 trees to the acre. It is further stated that time will probably show that 25 feet by 25 feet, or 70 trees per acre, is a better plotting for planting rubber trees.

It is explained that trees that are closely planted, have too small a leaf area, and are much more liable to attacks of disease. When tapping commences they are still further weakened, and, therefore, the renewal of bark is not vigorous, this renewed bark being so thin that it is impossible to tap the trees without wounding after the original bark has been consumed.

Citing benefits obtained by thinning out, the paper says that the trees are much healthier, yield more rubber, and renew their bark quicker. It has been found that after thinning out, many trees will yield double the amount of rubber, and not only that, but the quality is improved, for it is argued that labor is reduced and it follows that if the yield per tree is doubled, a less proportion of scrap will be obtained when only half the number of trees is being tapped. Again, if the number of trees is reduced, there will be a large saving on tapping equipment, as a less number of cups and spouts will be required to bring in the same amount of latex.

All this is clearly explained and illustrated in plain, simple language which native holders can easily understand.

Advising as to the best method of thinning out, the paper says that, first, all small, weakly trees, which are very backward in appearance, should be removed because their stunted growth is sure to make of them very poor yielders of rubber. The process of selection and elimination should next concern trees which have a very irregular growth, such as bad trunks and forked branches, which are liable to be split by winds. After these have been exhausted it may be found necessary to cut out a number of good trees in order to improve the spacing of those which remain.

If trees in the area to be thinned out have not reached the tapping stage, they should be reduced to 100 trees per acre immediately, but if they are producing it should be carried out gradually at intervals of, say, six months, so that any drop in yield will not be apparent. Trees should be cut out completely and roots extracted and burned in order that no disease may attack the dead stumps. To tap stumps to death is unprofitable because of the small margin left by the present price of rubber.

The drop in the yield of an area in process of thinning out is only temporary and after a period of six to twelve months the yield per tree increases and makes up for the trees which have been removed.

When trees are very closely planted the yields fall rapidly when tapping renewed bark is commenced, and while close planting may have shown good profits with rubber selling at high prices, today the margin of profit is very small, and

the maximum yield per tree must be obtained to keep down the expense of collecting.

The longer thinning out is delayed the more difficult is the work, and the longer will the remaining trees take to increase their yields, and the lower will be the ultimate profits per acre.

## COMPOSITION OF AN OLD RUBBER TREE.

AN ANALYSIS has been made, by M. Kelway Bamber, of a rubber tree 11 years old, measuring 34 inches in circumference at 3 feet from the ground. It was cut before leaf fall began. The trunk weighed 820 pounds and the branches and leaves 305 pounds; total 1,125 pounds. The trunk and branches were burned separately and yielded 0.445 per cent and 2.54 per cent of pure ash respectively. The total ash was 11.4 pounds, equivalent to 1.01 per cent on the whole tree. The total ash in 100 trees per acre would be 1,140 pounds, all of which has been taken up from the soil, and partly from the annual leaf-fall during 11 years' growth. The ash consists chiefly of carbonates and phosphates of lime, potash and soda. The phosphoric acid is about one-third of the lime, and one-half the potash content. The average percentage of soda is higher than the potash, which is unusual, and would indicate a deficiency of available potash in the soil in which the tree was grown. The table shows the composition of the ash as to its chief constituents:

Ash Constituents.	Wood, Per Cent.	Branches and Leaves, Per Cent.	Average, Per Cent.	Total per acre 100 Trees, Pounds.	Average Absorbed Annually, Pounds.
Lime .....	21.20	20.00	20.60	235	21.3
Magnesia .....	6.04	6.77	6.40	73	6.6
Potash .....	14.96	10.34	12.65	144	13.1
Soda .....	14.79	15.69	15.24	174	15.8
Phosphoric Acid...	7.80	6.53	7.16	81	7.3
Sulphuric Acid...	2.88	2.54	2.71	31	2.8

Dry rubber contains only about 0.32 per cent ash, and 400 pounds per acre would only remove about 1¼ pounds of mineral matter, a quantity that is negligible.

## PREPARATION OF RUBBER IN FRENCH AFRICA.

THE following translation from a circular addressed by the lieutenant-governor of the French Ivory Coast Colony to subordinate administrative officers is of interest:

Auctions recently held at railway terminals clearly demonstrated the fact that prices obtained for lots of rubber depended solely on the methods by which the rubber was prepared. Thus, fine quality vine rubber sold at 4.94 francs per kilogram [about \$0.43 per pound] and *Funtumia* rubber that was well prepared brought as high as 4.70 francs per kilogram [about \$0.40 per pound], whereas, poorly dried rubber brought only 3.80 francs per kilogram [about 33 cents per pound].

Therefore, you must oblige the natives to prepare their rubber properly and handle it carefully right up to the market day.

In this connection I wish to recall to your attention that the object of having rubber prepared in slabs is not merely to prevent fraud, i. e., by mixing foreign matter with the rubber. The slab form makes it possible: first, to thoroughly wash the rubber and eliminate all soluble impurities; second, to dry it easily and rapidly.

The latter operation should be pushed as far as possible. The increase in value is always worth the additional trouble.

Drying should be performed in the shade, in a well ventilated place. Slight smoking will help to preserve the dry slabs.

The principal deterioration of rubber is a decomposition or oxidation, which is favored by high temperatures. Well prepared rubbers, and especially vine rubber, are rarely subject to this form of decomposition; however, climatic conditions here are not favorable to the preservation of crude rubber, which should be delivered to the export houses as soon as possible after its preparation.

When, for any reason, the natives are obliged to hold their rubber, they should be instructed to store it in dark, cool, dry

places, where they should pile it up to reduce to a minimum the surfaces exposed to the air.

To recapitulate, you should constantly see to it that rubber be carefully prepared. Careful preparation is essential to maintaining quality and prices, which under the present circumstances, are of an importance you can readily realize.

#### ANNUAL MEETING OF MALACCA PLANTERS' ASSOCIATION.

THE annual general meeting of the members of the Malacca Planters' Association was held in Malacca, Malaya, on February 22.

##### LABOR DIFFICULTIES.

Reviewing the past year, the chairman stated that 1915 had been a particularly trying year for the planters on account of the shortage of labor, which threatened to become serious and was acutely felt towards the middle of the year. This shortage was due to the repatriation of a large number of coolies to China when the war broke out and to the total cessation of immigration from both India and China for several months. The government did not grasp the situation until it was assuming a serious aspect, not only for the planting, but also other industries in Malacca and, when matters were remedied, considerable time had elapsed before any appreciable improvement in the flow of immigration took place, with the result that matters became very serious for many estates.

##### RUBBER PROSPERITY.

The year 1915 had been one of great prosperity in Malacca. The increase in the price of rubber during the year, although perhaps anticipated to a certain extent by a few, came as a pleasant surprise to the majority, and resulted in a small land boom in Malacca. Rubber was being planted throughout the length and breadth of Malacca by small native holders.

The area under rubber in 1915 showed an increase of 17,262 acres as compared with the area in 1914, the figures being, 1914, 114,845 acres; 1915, 132,110 acres. Other forms of cultivation had remained more or less stationary.

##### NATIVE RUBBER.

The chairman's opinion was that a large proportion of the 17,000 odd acres of rubber planted in 1915 had been planted by natives, and he believed that the extensive planting of rubber by small holders should be viewed with concern by those interested in the future of rubber in the country. Apart from the question of rubber thefts, which were serious enough in their own way and many of which were probably traceable to small holders, the industry was facing the possibility of an outbreak of disease which, if it started in small holdings, might go on unchecked until it would become well established, and prove serious.

Upon investigation, it had been found that there were many small holdings on which trees had been tapped too young, and were therefore weakened and likely to be ready subjects for any form of disease that might appear. This matter should engage the serious consideration of the government, because the prosperity of Malacca depends mainly upon agriculture and particularly on the rubber industry. A conception of the importance of the latter could be formed by examining the export figures for 1915, which showed that the exports of plantation rubber from Malacca amounted to 202,901 piculs [27,052,790 pounds], valued at 24,506,929 Straits Settlements dollars [\$13,723,880]. Of these, 17,737 piculs [2,364,874 pounds], valued at 1,960,876 Straits Settlements dollars [\$1,098,091], were imported, making the net production of Malacca, 185,164 piculs [24,687,916 pounds],

equal to approximately 10,994 tons, an increase of 4,228 tons over the 1914 figures.

##### RUBBER THEFTS AND DEALERS' ORDINANCE.

A matter of much importance, which had engaged the attention of the association during the year and was still billed for further discussion, was the question of rubber thefts. The evil was widespread and had reached proportions which were not realized by the government.

The rubber dealers' ordinance came into force in 1910 and was made to deal with the serious evil of rubber stealing. The original proposal of the association was that licenses for rubber dealers should be given out on certain specified days, appointed just as the liquor licenses now are granted, to give planters who so desire an opportunity to oppose the application. This proposal had already been passed. Then it was suggested that every cultivator of rubber should have a license to trade. In the chairman's opinion, the present ordinance did not go far enough. It should be in book form and every transaction made should be endorsed on the license. The association also desired that on this license should be noted the acreage under cultivation, the acreage which was being tapped, and the probable amount of rubber which was to be produced in that area, the latter to be estimated by a competent authority. There were difficulties to be met in the estimates of production. There were cases proved in Malacca in which men disposed of rubber in amounts that were absolutely ridiculous when the acreage under their cultivation was considered. The association desires to assist the magistrate, and it is for the government to so amend the law that certain rubber may be considered as stolen until it has been proved by the defendant to the contrary. The license should have a photograph of the dealer, and also the license of the seller should be produced. The majority of the sales of rubber by their tappers were made to small holders adjoining the larger estates. Rubber stealing has been worse since the ordinance came into force, and it is necessary to devise more efficient means for controlling the dealers who purchased stolen rubber up country. The association feels that the rubber industry, which pays a large and increasing revenue to the government, is worth being protected by the latter.

Replying to the chairman, the local representative of the government, who was present at the meeting, said that since the rubber dealers' ordinance had come into operation in 1910, the production of rubber had probably increased 200 per cent, but "the total volume of theft might not be greater." European managers did not attempt to give annual returns, as called for by the ordinance. Rubber is one of those commodities difficult to identify, and under the system of laws which obtain in the colonies and throughout the British Empire proof is needed before any man could be convicted. The chairman was a potential receiver in many of these cases. The local representative suggested that efforts be made to seize the thief on the estate, so that identification of the goods might be easier. To this the chairman rejoined that the police have pronounced it disheartening to take any cases under the rubber ordinance, 50 per cent of such cases being discharged. It was voted that suggestions be forwarded to the governor.

##### DAMAGE TO RUBBER TREES BY PORCUPINES.

Rubber planters in India complain of damage done to their *Hevea* trees by porcupines. Several remedies have been tried, with indifferent success. It has recently been found that whitewashing the trees up to a height of two feet from the ground protects them from attack by these animals. During the rainy season the whitewash is liable to be washed off, but it is said that this inconvenience can be overcome by mixing gum with the lime.



### THE RUBBER SITUATION IN BRAZIL.

By Our Regular Correspondent.

CONDITIONS here continue to be most favorable. The prevailing rubber prices, though substantially lower than in the first days of the year, are still remunerative, even for those collecting their rubber in the most remote districts of the upper Amazon and, as little of this season's crop has been sold ahead, the people here have good prospects of reaping the full benefit of the present heavy demand. There will be real prosperity, both in Para and Manaus, if the entire crop can be sold while prices hold at their present level, and this crop will probably be a large one on account of the thousands of men that have been driven from their homes by the drought and famine in the State of Ceara and who are now employed in gathering rubber in the states of Para and Amazonas. These new rubber gatherers are, of course, unskilled and, though they certainly will increase our rubber production, they may also do great harm to the trees.

The once rich rubber districts on the Rivers Solimoes and Purus are said to be now abandoned, having been completely exhausted. In the islands around Para the trees are being literally tapped to death.

There are millions of rubber trees untapped in our vast forests. The difficulty and travel necessary to opening new *estradas* have led our native gatherers to visit the same *seringaes* year in and year out with the result that the exploited trees have been tapped to their limit. Once the lower bark has been tapped until it is useless, crude ladders are used to reach higher parts of the trees to practice "overhead" tapping, which is pushed as high as 30 and more feet above the ground. The relative abundance of labor we are now enjoying is leading to the opening of new *estradas* and exploitation of new *seringaes*. Fresh trees yield greater quantities of latex than trees that have been visited for years, and this exploitation of new sources may well account for the low prices at which our rubber can now be produced.



OVERHEAD TAPPING.

#### GERMAN PURCHASES.

Reports are current here that German interests have purchased about 5,000 tons of crude rubber in this country for delivery after the war. These purchases are said to have been paid for in gold, and their object is believed to be to make sure of a supply for a time when Germany might still find difficulty in purchasing through British concerns as she was doing before the war.

#### RUBBER DEALERS AFFECTED BY BRITISH "BLACK LIST."

Among the names of German and Austrian concerns established in Brazil which have been placed on the "black list" by the British Government are those of the following rubber dealers and exporters: Ohliger & Co., Para and Manaus; Pralow & Co., Manaus; and Semper & Co., Manaus. The effect of being black-listed is that these concerns are barred from shipping in British bottoms and from trading with British concerns. They can continue to do business with neutral countries and to ship their goods in neutral bottoms. As British steamship lines alone make

regular calls at Para and Manaus under present conditions, this blacklisting is a very serious matter for the firms concerned and it is said that attempts are being made by them to avoid these difficulties. An attempt was made to have the Brazilian Government interpose in the matter, but it has been intimated that in case of too great agitation the British Government would go so far as to withdraw British steamers altogether and Manaus would be reduced to dependence on the irregular service neutral shipping now offers.

#### IMPORT AND EXPORT DUTIES.

Our budget law for 1916 went into effect on January 1. It included no changes in the import or export duties on manufactured rubber. In fact, there are no duties at all on exports of manufactured rubber. As to the duties levied by our several rubber-producing states on exports of crude rubber, the only recent change in such duties is that prescribed by the government of the State of Manaus, in a decree dated June 12, 1915, which provided for an export tax of 7 per cent ad valorem on rubber produced in the territory of the Javary river and its Brazilian tributaries.

#### DISCRIMINATING DUTY REPEALED.

The Budget law for 1916 definitely repealed the provision in the budget law for 1915 for reduced rates on articles made of Brazilian rubber. It will be recalled in this connection that the 1915 law called for discriminatory duties on articles made of rubber of foreign origin, but neither the higher nor the lower rates applicable to rubber goods have actually been imposed since the early part of 1915, owing to the impossibility of distinguishing, in the manufactured goods, between Brazilian rubber and other sorts.

A change that will affect all dutiable imports, rubber goods included, is the increase in the proportion of import duties payable on a gold basis from 35 to 40 per cent, which will result in some increase of duty.

#### AMERICAN MANUFACTURERS FAVORED.

On January 14, 1916, the President of the Republic signed a decree that will continue the preferential treatment which has heretofore been allowed to products and manufactures of the United States, including manufactures of rubber on which the preferential reduction is 20 per cent. This is an important advantage to American tire manufacturers, many of whom are sending large quantities of their goods to this country.

#### PLANTATION PROPAGANDA.

We Brazilians continue to witness with indifference the efforts London rubber plantation interests are constantly making to lead manufacturers to believe that their best plantation sorts are superior to our Upriver fine Para. The indolence of our people in this connection is without excuse. It is not sufficient that we know our rubber to be the best of all. It is high time for taking measures to protect our interests and, at the same time, those of manufacturers. We should not allow these manufacturers to be misled by the incessant and well-planned propaganda of our chief competitors. We, too, should spend some money in exploiting the superiority of our native rubber for many manufactures. When will our authorities awake to this necessity, and when will they reduce our excessive export duties and thus help to place our rubber producers in a better position to meet plantation competition? I am sorry not to be able to answer.

#### CHANGE IN A BRAZILIAN RUBBER EXPORTING CONCERN.

A new rubber trading company has been chartered in this country to take over the export business heretofore carried on by Schnack, Nueller & Koehln, at Coromba, in Matto Grosso, at Puerto Suarez, Bolivia, and at other important points. The legal headquarters of this company are at Hamburg, Germany.

## Hevea in British Guiana.

NEWS from the biggest and potentially the best *Hevea* plantation in British Guiana is sure to be interesting, not alone to the American projectors but to all users of crude rubber.

For various reasons it has been felt that the Far East was alone adaptable for *Hevea* planting. Indeed, when some six years ago a great tract of land up the Mazaruni River was acquired and clearing begun, many experts were honestly doubtful about the ultimate success of the project. It, however, was not abandoned. On the contrary, under the intelligent management of a man well versed in tropical planting, land was cleared, seed brought in from the Malay states, and more than a thousand acres successfully installed.



THREE-YEAR-OLD HEVEAS, WINTERING.

The illustrations herewith give glimpses of most satisfactory accomplishment. The growth of the trees has been fully equal to that in any part of the world. There are no more diseases, leaf or root, the rainfall is ideal, and the land is so situated that high winds are unknown. Last, and most important, labor is cheap and abundant. Incidentally, very comfortable administration buildings have been erected. So comfortable are they and so delightful is the climate on the Mazaruni River that Colonel



MOTOR ROAD ON THE PLANTATION.

and Mrs. Roosevelt, who visited British Guiana this winter, made their whole stay at "The Hills," which is the headquarters of the Bartica Agricultural States plantation.

Regarding the plantation's progress, an extract from a letter written by George B. Withers, the manager, is of interest.

As you know, I bought some glass cups for tapping purposes last December, and expected them here just after I returned in January, and I waited and waited, but they did not come, so I started to tap 312 trees, as that was all the cups I had, and for ten weeks I have been tapping that number, we have had the



FIVE-YEAR-OLD HEVEAS.

usual dry weather, but they have been running well all the time. Then, as I heard last week of somebody who had some of the latest earthenware cups for sale I bought 1,000, which arrived here two days ago, and by the very same boat that brought these up to me, I had a letter from town saying the glass cups had arrived there at last; however, they will all come in handy soon.

The results of the tapping as far as I have been able to weigh so far, are as follows: Each 14 days' product is kept separately



TAPPING FIVE-YEAR-OLD HEVEAS.

and weighed as soon as dry, and as the weather has been very dry, we have now got weighed up the first four fortnights.

The following is the result from 312 five-year-old trees:

	Biscuits			Scrap, etc.			Total			Wet Rain.	
	Lbs.	Ozs.	Drs.	Lbs.	Ozs.	Drs.	Lbs.	Ozs.	Drs.	Days.	Ins.
First 14 days.....	16	10	8	4	15	12	21	10	4	8	.79
Second 14 days.....	33	5	12	5	9	3	38	14	15	10	2.52
Third 14 days.....	34	0	8	6	5	12	40	5	4	9	2.59
Fourth 14 days.....	28	14	12	6	15	14	35	14	10	5	2.57
	112	15	8	23	14	9	136	14	1	32	8.47

At the above rate this would give an average of 3 pounds, 4 ounces, 4 drams per tree for the year, which we certainly ought to improve on considerably, and the above tapping in the first fortnight includes all the very first cuts, from which, as you know, much is not given in the way of latex. Also this tapping has been done during the very worst time of the year that we have in regard to rainfall so that I hope, and expect that we shall average for the year a good deal more than the above would average, and this for five-year-old trees, I think you will agree is very good indeed.

## Recent Patents Relating to Rubber.

## THE UNITED STATES.

ISSUED APRIL 18, 1916.

- N**O. 1,179,417. Ammunition box with rubber buffers. W. Feller, assignor F. Krupp Aktiengesellschaft—both of Essen-on-the-Ruhr, Germany.
- 1,179,508. A combination rim and casing with cork filler. E. M. Deal, assignor to J. J. Brooks—both of Philadelphia, Pa.
- 1,179,552. Hose coupling and mender. L. R. Nelson, Peoria, Ill.
- 1,179,652. Safety heel with rubber parts. A. C. Rightor, Pittsburgh, Pa.
- 1,179,654. Rubber vehicle wheel tire. R. M. Roberts, assignor to F. T. Barber—both of Anderson, Ind.
- 1,179,668. Safety valve for tires. E. W. Shewmaker, assignor of twenty one-hundredths to M. D. Lawler and twenty one-hundredths to W. B. Schlottman—all of San Francisco, Calif.
- 1,179,692. Fluid hose. W. F. Bowers, San Francisco, Calif.
- 1,179,733. Emergency chain attachment for automobile wheels. L. E. McKinnon, Buffalo, N. Y.
- 1,179,743. Solid tire with coil spring. W. Murry and J. Conway, Shrewsbury, Mass.
- 1,179,771. Resilient tire. C. A. Smith, Wellsville, N. Y.
- 1,179,774. Spring wheel with rubber tire. F. D. Stuart, Douglaston, N. Y.
- 1,179,859. Resilient tire with rubber abutments. S. F. Millard, Norwalk, Conn.
- 1,179,871. Textile fabric glove having the palm surface and finger portions impregnated with a rubber composition. J. P. St. John, New Haven, Conn.
- 1,179,884. Cushion tire for vehicles. J. F. White, Pittsburgh, Pa.
- 1,179,996. Hydrometer having a rubber bulb. J. and G. Berg—both of Brooklyn, N. Y.
- 1,180,012. Vehicle wheel comprising a plurality of annular pneumatic cushions. H. B. Coats, Veedersburg, Ind.
- 1,180,035. Hose supporter. C. J. Hausen, New York City.
- 1,180,115. Tone post for violins comprising a rubber part. H. Edwards, Downsville, N. Y.
- 1,180,182. Means for clearing waste pipes. G. Petersen, Spokane, Wash.
- ISSUED APRIL 25, 1916.
- 1,180,523. Force cup. C. F. Schuh, Newark, N. J.
- 1,180,381. Tire fastener for wheels. H. T. Dunbar, Buffalo, N. Y.
- 1,180,390. Bead for tires. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,180,391. Device for lathering preparatory to shaving. W. A. Gatzert, Grünwald, near Munich, Germany.
- 1,180,424. Self-filling fountain pen. E. G. Peck, Seymour, Conn.
- 1,180,437. Means for vulcanizing punctures in rubber tires. S. I. Rose, assignor to the Marvel Accessories Manufacturing Co.—both of Cleveland, Ohio.
- 1,180,452. Rubber boot. A. H. Steen and H. McNulty, Berlin, assignors to Canadian Consolidated Rubber Co., Limited, Montreal—both in Canada.
- 1,180,495. Gear. F. A. Headson, assignor to H. W. Johns-Manville Co.—both of Milwaukee, Wis.
- 1,180,502. Locking ring for tires. H. Kaplan, assignor to Long Manufacturing Co.—both of San Francisco, Calif.
- 1,180,523. Filler for vehicle tires. C. M. Nevins, Frontier, Mich.
- 1,180,633. Retainer for rubber footwear. J. H. Brackin, Newark, Del.
- 1,180,681. Toy balloon. R. B. Whelan, Los Angeles, Calif., assignor to Albert Behrend and Joseph Rothschild, composing the firm of Behrend & Rothschild, New York City.
- 1,180,704. Method of producing waterproof coatings of balata on objects which are influenced by humidity. M. Dickert, Werne, Germany.
- 1,180,714. Method of patching hose and tool therefor. R. C. Hall, Lexington, Ky.; N. C. Hall administratrix of said R. C. Hall.
- 1,180,733. Rubber hose bulb for spraying of flushing devices. J. A. Mulherin, St. Louis, Mo.
- 1,180,839. Waterproof life-saving appliance. I. Gilbert, Chicago, Ill.
- 1,180,887. Fountain pen. T. Tanimura, Rock Springs, Wyo.
- 1,180,911. Device for repairing punctures. C. B. Drake, Norfolk, Va.
- 1,180,946. Self-filling fountain pen. F. Riesenberger, assignor to L. E. Waterman Co.—both of New York City.
- 1,181,001. Waterproof sheet attachment for bed pan. J. C. Griesel, assignor of one-half to W. F. Doyle—both of Pottsville, Pa.
- 1,181,049. A wheel for cars comprising a removable tire of solid rubber. D. Wiesenacker and F. Cremer, Fulda, Germany.
- 1,181,060. Hose coupling. R. Bennett, Beacon, N. Y.
- 1,181,065. Elastic rubber inner liner for pneumatic tires. P. T. Coffield, Dayton, Ohio.
- 1,181,069. Puncture proof tire. J. C. Fair and T. A. Anderson, Chicago, Ill., assignors to Premium Punctureproof Tire Co., a corporation of Maine.
- 1,181,088. Demountable rim for wheels. I. D. Walter, assignor of fifty-three one-hundred-and-fiftieths to J. Brinkerhoff, one-tenth to R. F. Cole, one-twentieth to T. Flournoy, one-fiftieth to J. W. Gant, one-twentieth to J. G. Gant, and one-fiftieth to S. A. Latimer—all of Harrisburg, Ark., and one-tenth to C. B. Bailey, Wynne, Ark.
- 1,181,100. Wheel rim for pneumatic tires. J. H. Fawkes, Portland, Oreg.
- 1,181,101. Fountain pen. E. Winne, New York City.

## Reissues.

- 14,119. Friction and metal plug for rubber heels and other tread surfaces. F. Berenstein, Chelsea, Mass., assignor to Panther Rubber Manufacturing Co., Stoughton, Mass.

ISSUED MAY 9, 1916.

- 1,182,162. Tool for use in the manufacture of shoes comprising a pad of untensioned spongy rubber. F. M. Furber, Revere, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
- 1,182,168. Pad garter. C. A. Hamlin; F. E. Lipscombe—both of Auckland, and H. Spencer, Hamlin, Wellington—all of New Zealand, administrators of said G. A. Hamlin, deceased.
- 1,182,227. Bridle having an electric strip between the brow band and blinders. M. J. Stephan, Nortonville, Kans.
- 1,182,246. Penholder having an expansible and elastic rubber sleeve. W. S. Bridges, Chicago, Ill.
- 1,182,257. Storage battery. F. Engel, Buffalo, assignor to U. S. Light & Heat Corporation, Niagara Falls—both in New York.
- 1,182,262. Sanitary skirt shield. N. H. Fose, Appleton, Wis.
- 1,182,297. Tire. A. D. Morris, Philadelphia, Pa.
- 1,182,341. Truss, comprising an elastic strap. W. T. Bobo, assignor to The Easy Truss Co.—both of Battle Creek, Mich.
- 1,182,357. Method of constructing pneumatic tires. F. S. Dickinson, New York City.
- 1,182,433. Resilient pneumatic wheel, which comprises an inflatable element surrounding the hub. D. D. Stoner, Cincinnati, Ohio.
- 1,182,579. Pedal pad. F. J. Mason, assignor of one-half to S. E. Allen—both of Los Angeles, and one-half to J. C. Rice, San Diego—both in California.
- 1,182,600. Tire. W. E. Supernaw, Elgin, Ill.
- 1,182,604. Golf ball. F. L. O. Wadsworth, Sewickley, Pa.
- 1,182,605. Golf ball. F. L. O. Wadsworth, Sewickley, Pa.
- 1,182,634. Pneumatic tire. W. B. Buckley, Washington, D. C.
- 1,182,647. Combined non-skid and traction device for dual tired wheels. M. H. Cleaver, assignor to Neverskid Manufacturing Co., Inc.—both of New York City.
- 1,182,669. Outside layer of rubber compound for conservation in the wear of rubber vehicle tires. J. T. Flaherty, Springfield, Mass.
- 1,182,698. Tire patch. J. G. Moomy, Erie, Pa.
- 1,182,699. Tire liner. J. G. Moomy, Erie, Pa.
- 1,182,756. Life saving suit. M. A. Czerkas, Philadelphia, Pa.
- 1,182,764. Anti-slip underlay for rugs, comprising a sheet of duck having one face treated with rubber. E. W. Harral, Bridgeport, Conn.
- 1,182,810. Bath appliance. C. E. Stalter, Detroit, Mich.
- 1,182,820. Non-slipping rubber attachment for the soles and heels of boots and shoes. J. H. Turner, Abingdon, England.
- 1,182,871. Inflatable tire. H. C. Boggs, Decatur, Ala.
- 1,182,882. Bowling pin, the body of which consists of a composition of hard vulcanized rubber. M. J. Whelan, Muskegon, Mich., assignor to The Brunswick-Balke Collender Co., Chicago, Ill.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

## THE DOMINION OF CANADA.

ISSUED FEBRUARY 29, 1916.

- 167,359. Tire tread. D. B. McKenzie and A. Fowler—both of Winnipeg, Manitoba, Canada.
- 167,366. Dust cap for valve stems of tires. G. F. Fisher and A. Bailey—both of Plainfield, New Jersey.
- 167,367. Dust cap for valve stems of tires. E. L. Aiken, Springfield, Mass.
- 167,368. Massage appliance. C. H. Archibald, East Las Vegas, New Mexico.
- 167,406. Fish bait box with elastic front section. P. Lamb, Denver, Colo.
- 167,410. Tire forming strip. J. T. Lister, Cleveland, Ohio.
- 167,441. Cord for tire casings. J. D. Tew, Akron, Ohio.
- 167,425. Shoulder rest for violins secured to the instrument by elastic bands. B. Poehland, Brooklyn, N. Y.
- 167,428. Safety valve for tires. J. Riehl, Winnipeg, Manitoba, Canada.
- 167,439. Laminated fabric. L. A. Subers, Cleveland, Ohio.
- 167,441. Cord for tire casings. J. D. Tew, Akron, Ohio.
- 167,489. Composite sole having a tread portion of rubber. The Williams-Kneeland Co., South Braintree, Mass., assignee of W. F. Bostock, Providence, R. I.
- 167,520. Tire chain. M. Bodenstern, Rochester, N. Y.
- 167,524. Tire valve and pressure gage. O. F. R. Bromberg, San Diego, Calif.
- 167,707. Triangular-shaped rubber cushion for game tables. The Brunswick-Balke-Collender Co., assignee of M. J. Whelan, Muskegon, Michigan.
- 167,799. Valve for tires. M. J. Payne, Staunton, Va.
- 167,906. Pneumatic tire. H. Jancovich, Pittsburgh, Pa.
- 167,910. Tire. H. M. Lambert, Portland, Oregon.
- 167,955. Club consisting of a piece of wire rope with ferrules at both ends and a covering of rubber. E. E. Welfen, Christiania, Norway.

[Chemical Patents will be found on page 469; Machinery and Process Patents on page 479.]



## THE UNITED KINGDOM.

## PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

\*Denotes Patents for American Inventions.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 12, 1916.]

- 24,022 (1915). Razor strap having a rubber end piece. G. H. De Naveene, 28 Avenue Bosquet, Paris.
- 24,105 (1915). Waterproof sleeping bag and marine life preserver. M. A. Campart and R. A. J. Amy, 10 Clifford street, and F. C. Bacon, 29 Portland street—all of London.
- 24,124 (1915). Spring wheel with pneumatic tire. J. Gonzalo Y Garrido 44, Gran Via, Barcelona, and F. R. De Dampierre, 8, Hermosilla, Madrid.
- 24,128 (1915). Crutch with armpit air cushion. F. A. Pennington, 10, Halesden Road, Heaton Chapel, Stockport, Cheshire.
- 24,164 (1915). Rubber mats, stair nosing, and treads. A. L. Neeson, 52, Old Bailey, London.
- 24,208 (1915). Overshoe. A. Johnston, and North British Rubber Co., Castle Mills, Edinburgh.
- 24,261 (1915). Figure having rubber base for use in table games. H. P. Robbie, 154, Perth Road, Dundee.
- 24,270 (1915). Life belt comprising rubber chambers containing gas forming chemicals. A. P. Rowe, and F. E. Ardrey, 9 Grand Parade, Muswell Hill, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 19, 1916.]

- 24,441 (1915). Rubber grips for electric cords. R. J. Quainton, 53, Clarendon Road, Putney, London.
- \*24,448 (1915). Shirt with elastic gussets in the neck band. A. Bernstein, 31, North State street, Chicago, Ill.
- 24,499 (1915). Demountable rim. A. G. De Grey and Auto Sundries, Ltd., 10a, Lower Grosvenor Place, London.
- \*24,559 (1915). Rubber faced metal shields for camera and like supports. J. H. Klenck, Warren, Pa.
- 24,569 (1915). Vehicle wheel with interior pneumatic cushions. G. R. Taylor, 373, Bath street, and R. Whyte, Reid street, Bridgeton—both in Glasgow.
- 24,570 (1915). Means for opening and closing the sliding lights of windows comprising a rubber lined bar. J. S. Bedford, 61, Park street, Blakenhall, and J. A. Cooper, 103, Owen Road—both in Wolverhampton.
- 24,586 (1915). Rubber tube in a tension apparatus for yarn winding. W. Lister, 68, Castle street, Nelson, Lancashire.
- 24,624 (1915). Apparatus for restoring respiration. R. H. Davis, 187, Westminster Bridge Road, London.
- 24,680 (1915). Treatment of rubber latex. S. Milne, 11a, Grange Road, Edinburgh. [See THE INDIA RUBBER WORLD, November 1, 1915, page 64.]
- 24,683 (1915). Spring wheel with continuous outer rigid ring and rubber ring and like cushions. P. F. Dundon, San Francisco, California.
- 24,752 (1915). Hard rubber tires provided with a number of concentric rows of transverse cells filled with softer rubber. R. K. Hearn, Netherton, The Downs, Wimbledon, London.
- 24,815 (1915). Filter for attachment to a suction pipe for field service comprising a nozzle of rubber. W. Brookes, 28, Addison Road North, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 27, 1916.]

- 46 (1915). Metal and rubber tread bands for tires. R. von Krenski, 25 Leasingstrasse, Berlin.
- 56 (1915). Combination tent, ground sheet and cape. G. H. Dale, 3 Woltemade, Cape of Good Hope.
- 126 (1915). Combination sole of rubber and cork. E. C. R. Marks, 57 Lincoln's Inn Fields, London.
- 146 (1915). Tread band for twin tires. A. J. Law, 29 Southampton Buildings, London.
- 147 (1915). Exercising apparatus, the links of which are composed of elastic cords. E. Sandow, 329 St. James street, London.
- 157 (1915). Non-inflatable rubber tire. W. E. Kerslake, 8 Mill Lane, West Derby, Liverpool.
- 173 (1915). Rubber tired spring wheel. R. Greenwell, Huntly, Auckland, New Zealand.
- 206 (1915). Puncture repair band for tires. W. Allen, 22 Broad street, Seaford, Sussex.
- 222 (1915). Inflating valve for use with pneumatic life saving apparatus, sponge substitutes, and polishing pads. J. H. Devlin, 11 Johnson street, Notting Hill, London.
- 240 (1915). Renewable non-slip rubber treads for horseshoes. F. Sheppard, Coach Works, Temple street, Swindon, Wiltshire.
- 285 (1915). Rubber cap for reservoir gum bottle. H. J. Visek, 5 Rangoon street, Fenchurch street, London.
- \*288 (1915). Attaching artificial teeth to vulcanize plates. F. H. Nies, 859 Bay Ridge avenue, Brooklyn, and J. F. Caretto, Baldwin—both in New York.
- 100,088 (1914). Single tube pneumatic tire. C. A. G. Deterding, The Hague.
- \*100,101 (1914). Method of forming cord tire casings. F. S. Dickinson, 233 Broadway, New York City.
- \*100,102 (1914). Hose pipe comprising an outer covering and a removable rubber lining. R. Many, 127 Duane street, New York City.
- \*100,108 (1914). Rubber packing washer for dust caps of pneumatic tire valves. H. P. Kraft, 219 Godwin avenue, Ridgewood, N. Y.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 3, 1916.]

- 323 (1915). An appliance for treating foot rot in sheep, comprising a rubber boot molded to the shape of the hoof. C. Liddiard, 27 Somerset Road, Frome, Somersetshire.
- 365 (1915). Rubber faced target practice apparatus. W. J. Mellersh—Jackson, 28 Southampton Buildings, London.
- 392 (1915). Rubber impeller vanes and other rubber parts for centrifugal and turbine pumps, etc. R. C. Parsons, 39 Victoria street, London.
- 434 (1915). Wheel tires. F. Ilsemann, Bremen-Horn, Bremen, Germany.
- 518 (1915). Hair curling appliances comprising rubber bands. H. E. Marcel, 534 Oxford street, London.
- 603 (1915). Brushes, having their bristles set in vulcanizable material. Rubber Set Brush Co., 21 Bucklersbury, London, and A. H. Timmis, Fairmount, Harrow View, Harrow, Middlesex.
- 664 (1915). Air escape valves for discharging vitiated air from divers' helmets. R. H. Davis, 187 Westminster Bridge Road, London.
- 665 (1915). Rubber faced portable track wheels. R. H. Fowler, H. Livsey, and H. Walker, Steam Plough Works, Leeds.
- \*100,141 (1914). Rubber heel with metal insert. J. M. van Heusen, 101 Robinwood avenue, Jamaica Plain, Boston, Mass.

## NEW ZEALAND.

ISSUED MARCH 16, 1916.

- 35,937. Postmarking machine with rubber band. R. M. Simpson, Wellington, N. Z.

ISSUED MARCH 30, 1916.

- 35,914. Hose reel. L. J. Bennington, of Geraldine, N. Z.
- 35,924. Milking machine teat cup of rubber. H. Roosen, of "Euroma," Sydney street, Willoughby, Sydney, N. S. W.
- 36,178. Milking machine teat cup. H. R. Jenkins, of Eltham, N. Z.

## THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 478,488 (April 23, 1915). Elastic tire for motor vehicles. A. Dreyer.
- 478,552 (April 29). Detachable wheel. Firm of Adolph Saurer.
- 478,579 (May 3). Improvements in the manufacture of tire casings. The Dunlop Rubber Co., Limited.
- 478,584 (May 4). Pneumatic tire. The rim is built so that its sides enclose the casing and the corresponding part of the inner tube in such a manner that the edges of the rim are above the average horizontal diameter of the inner tube, the unprotected part of the elastic casing is thus reduced to an arch considerably less than 180 degrees. The casing thus protected by the rim is now provided with beads and has on either side a heavy tube forming a puncture-proof tread. There are two flaps covering the part of the arch inside the inner tube. Hall, Behrens and Godel.
- 478,642 (May 8.). Puncture-proof pneumatic tire. This tire consists of an air tube, a flexible casing, an intervening rigid sleeve, a certain number of plungers that slide radially in the holes of the intervening sleeve and thus transmit to the air chamber the displacements of the casing. Parts like annular plates and bolts hold the whole together on the rim of the wheel. J. A. Shearer.
- 478,648 (May 10). Elastic tire for vehicles. E. W. Price.
- 478,719 (December 21, 1914). Pneumatic tire for vehicle wheels. G. W. Beldam and A. V. B. Ryall.
- 478,791 (May 22, 1915). Improvements in vehicle wheels and tires. L. Linlen.
- 478,806 (May 26). Improved nipple with one or more non-elastic ribs embedded in the rubber at certain distances from the edges, preventing the nipple from collapsing. W. A. Kokke.
- 478,819 (May 27). Improved anti-skid devices for pneumatic tires. A. Gorecki.
- 478,826 (December 1, 1914). Improvements in elastic tires. Deal and Brooks.
- 478,892 (June 2, 1915). Elastic wheel. Orriols and Artigas.
- 478,901 (June 3). Splash guard for vehicles. H. Flad.

## TRADE-MARKS.

THE UNITED STATES.

- 89,692. C. A. Rodriguez, New York City. A circle within a circle, the word *Marathon* between, and in the center three legs 120 degrees apart wearing garters. For garters.
- 91,501. Cumings Brothers, Flint, Mich. A triangle, surrounding the letter B within the letter C. For tire plasters or pads for use inside of rubber tires, etc., etc.
- 92,458. Williams-Kneeland Co., South Braintree, Mass. Representation of a sole with the word *Nimble* in the center. For tap soles having a composite structure of rubber and leather, etc.
- 92,728. Gaul, Derr & Shearer Co., Philadelphia, Pa. A boy in Dutch costume holding a tire and standing on a square with the words *Gadesh Goods* in center.
- 93,211. Hart, Schaffner & Marx, Chicago, Ill. The word *Trumpeter*. For use on raincoats, etc.
- 93,039. Cohen, Goldman & Co., Inc., New York City. A design comprising tennis racquets, golf clubs, baseball bat and balls within a laurel wreath, beneath the word *Sportex*. For raincoats, etc.
- 93,209. Hart, Schaffner & Marx, Chicago, Ill. The words *Six Hundred*. For raincoats, etc.
- 93,210. Hart, Schaffner & Marx, Chicago, Ill. The words *Fifty-Five*. For raincoats, etc.

- 93,289. John Wanamaker, Philadelphia, Pa. The words *Down Stairs Store*. For clothing, including rubber footwear.
- 93,329. Boston Rubber Shoe Co., Malden and Boston, Mass. An outline of a hub with the word *Hub* on it. For rubber footwear and combination of rubber, leather, etc.
- 91,387. D. Sabel, New York City. The words *Red Top* combined with the representation of a red spinning top. For a tire puncture sealing fluid.
- 91,569. Everybody's Shoe Store, Washington, D. C. The words *Everybody's Shoe Store*. For shoes made of leather, rubber, etc.
- 93,368. Lee Tire & Rubber Co., Whitmarsh township, Montgomery county, Pa. Illustration of a gray tread tire having two red side bands. For rubber tires and casings.
- 93,443. United States Tire Co., New York City. Illustration of a tire with a white side wall stripe. For rubber tires.
- 93,697. J. Floyd, Savannah, Ga. Representation of a golf ball having an eye impressed thereon. For golf balls.
- 93,714. The Miller Rubber Co., Akron, Ohio. The word *Watermelon*. For toy balloons.
- 93,715. The Miller Rubber Co., Akron, Ohio. The term *La-la-pa-looser*. For toy balloons.
- 93,716. The Miller Rubber Co., Akron, Ohio. The word *Zip-elin*. For toy balloons.

## THE DOMINION OF CANADA.

- 21,465. The Hurlbut Co., Ltd., Preston, Ontario. The word *Playtime*. For rubber footwear, etc.
- 21,466. Mishawaka Woolen Manufacturing Co., Mishawaka, Indiana. The word *Pac*. For rubber footwear, clothing, blankets, etc.
- 21,500. The B. F. Goodrich Co., New York City. Narrow red band around the upper portion of the rubber boot and shoe. For rubber footwear.
- 21,501. The B. F. Goodrich Co., New York City. The word *Hipress*. For rubber footwear.

## DESIGNS.

- 48,885. Rubber tire. O. P. Downing, Dallas, Tex.
- 48,892. Pneumatic tire. A. Hargraves, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
- 48,904. Elastic fabric. C. A. Lapworth, West Bridgewater, assignor to The Lapworth Webbing Co., Brockton—both in Massachusetts.
- 48,905. Elastic fabric. C. A. Lapworth, West Bridgewater, assignor to The Lapworth Webbing Co., Brockton—both in Massachusetts.
- 48,906. Rubber tire. C. O. C. Lindrooth, Redfield, S. D., assignor to The Pharis Tire & Rubber Co., Newark, Ohio.
- 48,926. Elastic vehicle tire. A. L. Breitenstein, Akron, Ohio, assignor to The Rubber Products Co., Barberton, Ohio.
- 48,932. Rubber pad for boots and shoes. H. P. Fouqué, New York City.

## CUSTOMS RULINGS.

Mention was made last month of the customs' decision that small rubber balloons with advertisements printed upon them were decided to be toys and duty appraised as such. A similar case has since been decided when Florent Bauwens of St. Louis imported a large number of these balloons upon which the names of various city parks were stamped. He contended that the entry should be allowed as india rubber manufactures calling for a duty of 10 per cent, but the board of general appraisers decided that they were subject to a duty of 35 per cent as toys or their parts.

As is well known, the audiphone is an instrument used by partially deaf persons to aid their hearing. It consists of a fan-shaped sheet of hard rubber attached to a suitable handle and with a cord so placed as to draw the fan into the shape of a sounding board. The collector claimed that these were fans and dutiable at 50 per cent, but the board of appraisers has reversed this ruling, being convinced that the article was not a fan in the generally accepted sense of the word and should not be classified as such. An entry was given at 25 per cent as manufactures of rubber.

At the Boston Custom House a protest was filed by Ashworth Bros., Inc., when the government claimed that the chief value in rubber-faced card cloth was the cotton in the fabric, and assessed duty at 30 per cent. It was shown that rubber was the component material of value, and the board accordingly admitted the cloth at a duty of 10 per cent.

A decision regarding raincoats is interesting. W. B. Hutchinson & Co., Seattle, Washington, claimed that as cotton wearing apparel the duties should be 30 per cent, but the collector claimed that they should be classified as wearing apparel composed wholly or partly of wool and dutiable at 44 cents per pound and 60 per cent ad valorem, and this decision of the collector has been affirmed.

## JUDICIAL DECISIONS.

## FEDERAL RUBBER MFG. CO. V. HAVOLIC—AND OTHERS.

Havolic worked for the plaintiff; his duties were to feed stock into a tubing machine. In this department there was a compressed air system with hose and nozzle. Employees were forbidden to use the hose for cleaning their clothes. Havolic knew of the prohibition, but one day disobeyed it. A fellow workman took the hose from his hand and playfully prodded Havolic with the nozzle, thereby injuring him so that he was totally disabled for 17 weeks. He sued under the Workmen's Compensation Act, and the case came before the Industrial Commission of Wisconsin, which made an award in favor of the claimant. The employer appealed to the Circuit Court. The award was confirmed and appeal was taken before the Supreme Court of Wisconsin, where the decisions were reversed, it being held that the Workmen's Compensation Act of Wisconsin was enacted to provide compensation for injuries sustained when the causative danger is peculiar to the work, and that the workman is not entitled to compensation for injuries that do not result from a causative danger of his employment. (156 Northwestern Reporter, 143).

AJAX-GRIEB RUBBER CO., V. HUBBARD.—The former brought suit against the latter on a verified account of \$586.04. Answering, the defendant pleaded in set-off a sum of \$267.50, the value of certain goods alleged to have been returned by him to the plaintiff and, by cross-action, sought to recover other amounts aggregating \$750. He agreed that \$376.12 of the plaintiff's claim was just and asked for judgment in the sum \$364.48, over and above the amount due by him to the plaintiff.

The trial court found for the plaintiff in the sum of \$115.54, which was less than the amount claimed, and the plaintiff appealed.

There being no statement of facts or finding of facts in the record of the case, the court of appeals held that it could not determine that the judgment on the contested issues was erroneous, nor could it review errors in overruling special exceptions to the pleadings.

The decision of the trial court must therefore be affirmed. (Court of Appeals of Texas, 181 Southwestern Reporter, 568).

IN RE DURNEY. IN RE REVERE RUBBER CO. IN RE AMERICAN MUTUAL LIABILITY INSURANCE CO.—Durney, an employe of the Revere Rubber Co., was injured on September 28, 1912. His average weekly wages were \$22. He was paid a maximum compensation under the statute, until September 7, 1914. On September 8, 1914, he returned to work, but was then partially incapacitated, his weekly wages only amounting to \$13.20. Had there at the time been no business depression, these wages would have amounted to \$15 per week. Durney was awarded partial compensation based on one-half the difference between his average weekly wages before the injury (\$22), and his average weekly wages since the injury (\$13.20). The insurer, the American Mutual Liability Insurance Co., appealed, and the Supreme Court of Massachusetts affirmed the award, holding, that under the Workmen's Compensation Act, providing that in case of partial incapacity the employe should be paid one-half the difference between his average weekly wages before his injury and the average weekly wages he is able to earn thereafter, no deduction from wages earned before the injury should be made because of business depression. The award should be based on difference between the wages the employe was actually earning before the injury and the wages he is able to earn thereafter, although if his wages are reduced because of a depression in the business conditions, the amount of such reduction should be ascertained and added to the wages the employe actually receives. (111 Northwestern Reporter 166).

## Review of the Crude Rubber Market.

### NEW YORK.

MAY has been a very dull, uninteresting period for the local importers and dealers in crude rubber. Early in the month the market developed an unsettled condition that reflected the dull tone of the London market. There was an absence of trading, due to the holders' reluctance to accept orders at prices that were under the market. Both buyers and sellers appeared to be awaiting some decisive development that would definitely change the monotonous tone of the market. Predictions that the bottom had been reached and a reaction was imminent were daily confuted by prices that continued to seek lower levels. This condition of general apathy on the part of traders and the steady decline of prices were the dominant features of the month. The factors that are controlling the market are not so well hidden that the fundamental causes cannot be, at least, surmised. For instance, there is a lot of rubber in sight; the manufacturers accumulated large stocks prior to April 1; the anticipated heavy spring business in tires has not materialized, due to the backward spring weather; and machinery for new equipment is being delivered very slowly. Everyone is confident that the bottom in prices has been reached and is waiting for the reaction that will follow.

New York arrivals for the first three weeks of May are 6,756 tons compared to 4,000 tons for the same period last month, and are as follows: Plantations from London and Liverpool, 2,720 tons; Singapore and Colombia, 1,117 tons; Batavia, Java, 575 tons; Para and Manaos, 1,875 tons; Africans, 205 tons; Centrals, 84 tons; Manicoba, 180 tons.

May 1, first latex, spot and nearby, were quoted 77 cents; July-December, 76 cents. Smoked sheet ribbed, spot and nearby, were 76½ cents; July-December, 75½ cents. Upriver fine, spot and nearby, were quoted 69 cents and May-June 70 cents. On May 29, First latex, spot and nearby, were quoted 67 cents, July-December 67 cents. Smoked sheet ribbed, spot and nearby, were quoted 66 cents, July-December 66 cents. Upriver fine, spot and nearby, were quoted 66 cents, and June-July 67 cents. There was a decline during this period of 10 cents in the spot plantation grades, 9 cents in the futures, while Para sorts were 3 cents less than four weeks ago. The fact that futures have recently been higher than spot rubber in New York, while the reverse is the case on the London market, is a strange anomaly.

### LONDON.

The market was heavy early in the month due to the quantities of rubber in sight, and fair business was being done, principally by the exporters. Shipments to the United States had gone forward in much greater volume than last month, with the result that permits were withheld for a time. On May 1, Standard crepe, spot was quoted 3s. ¾d. [74.5 cents]. October-December was 3s. 1¼d. [75.5 cents]. Smoked sheets, spot, were 3s. ½d. [73.99 cents]. Hard fine sold at 2s. 10½d. [69.93 cents]. Values continued to fall during the month and on May 24, Standard crepe, spot, was selling at 2s. 9d. [66.89 cents]. July-December was quoted 2s. 9d. [67.91 cents]. Smoked sheets, spot, were 2s. 8d. [64.87 cents] and July-December sold for 2s. 9½d. [67.91 cents]. Standard crepe having declined, 3¼d. [7½ cents] and Smoked sheet, 4¼d. [8½ cents] during the first three weeks of May. The peculiar position of spot rubber selling from ½d. to 1d. [1 to 2 cents] below futures continues to be a surprising feature of the London market.

### SINGAPORE.

The 5 auctions held between April 27 and May 23, inclusive, realized a total sale of 1,350 tons of all grades. First latex crepe

averaged 67.5 cents and Smoked sheet averaged 65.3 cents. The market has shown a steady decline of 13.2 cents a pound for First latex and 11.9 cents for Smoked sheet. On May 23 the difference between Singapore and New York spot prices was 7 cents for First latex and 7.8 cents for Smoked sheet rubbered, with the demand active.

### NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and May 29, the current date:

PARA.	June 1, 1915.	May 1, 1916.	May 29, 1916.
Upriver, fine, new.....	61 @	70 @70½	66 @
Upriver, fine, old.....			
Islands, fine, new.....	52 @	64½ @	60 @
Islands, fine, old.....			
Upriver, coarse, new... 46 @		54½ @55	49 @
Upriver, coarse, old.....			
Islands, coarse, new... 28½ @		34½ @	30 @
Islands, coarse, old.....			
Cameta ..... 32 @		38½ @	34½ @
Caucho, ball, upper... 47½ @		56 @	49 @
Caucho, ball, lower... 44½ @		54 @	45 @
PLANTATION.			
First latex crepe { Spot... 60½ @	Spot..... 78½ @79	Spot..... 66½ @67½	
{ Afloat 60½ @	May-June 78½ @79	July-Dec. 67 @	
Amber crepe, light .....	{ Spot..... 76½ @77	Spot..... 64 @65½	
	{ May-June .....	July-Dec. 64 @	
Brown crepe, clean.....	{ Spot..... 75½ @76	Spot..... 62 @63½	
	{ May-June .....	July-Dec. 62 @63	
Smoked sheet, ribbed .....	{ Spot... 61 @	Spot..... 78 @78½	Spot..... 66 @
	{ Afloat 61 @	May-June 78 @78½	July-Dec. 65 @67
Fine sheets and biscuits, unsmoked .....	Spot..... @		
CENTRALS.			
Corinto ..... 46 @	51 @	42 @43	
Esmeralda, sausage .... 45 @	50 @50½	41 @42	
Nicaragua, scrap .....	50 @	40 @41	
Mexican plantation, sheet .....	64 @65	42 @43	
Mexican, scrap .....	48 @49	39 @42	
Mexican, slab .....	36 @37	36 @37	
Manicoba .....	47 @	44 @46½	
Mangabeira, sheet .... 38 @	42 @	39 @	
Guayule .....	38 @39	38 @39	
Balata, sheet ..... 55 @	67 @	70 @70½	
Balata, block ..... 45 @	54 @	.....	
AFRICAN.			
Lopori, ball, prime.... 53 @55	70 @	64 @	
Lopori, strip, prime....			
Upper Congo, ball, red....	68 @	62 @	
Rio Nunez Niggers.... 54 @	67 @	63 @	
Conakry Niggers ..... 55 @	72 @	61 @62	
Massai, red ..... 54 @	68 @69	59 @	
Soudan, Niggers .....			
Cameroon, ball, soft....			
Cameroon, ball, hard....			
Benguela, No. 1..... 30 @	48 @	44 @	
Benguela, No. 2.....	42 @44	39 @	
Accra, flake ..... 23 @	38 @	35 @	
EAST INDIAN.			
Assam .....		44 @	
Pontianak ..... 7½ @ 7¼	10½ @	7¼ @	
Gutta Sink .....	17 @	25 @	
Gutta red Niger .....	27 @	25 @	
Borneo III .....	30 @		
Gutta Percha .....	1.50 @2.00	1.50 @2.50	

### MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by the Waterhouse Co., Limited:

Date.	Crépe, Price per lb.	Smoked Sheet, Price per lb.	Sold.	Market.
April 27..cents	75.6	72.6	616,000	Weak.
May 4 .....	68.4	68.8	378,560	Weaker—less demand.
May 10 .....	67.5	63.3	403,200	Steady—demand moderate.
May 17 .....	63.7	61.2	616,000	Quiet—Slightly weaker.
May 23 .....	62.4	60.7	672,000	Active—good demand.



## RUBBER AFLOAT TO THE UNITED STATES.

Steamship.	From Penang.	To.	Pounds.
Sardinia .....	Feb. 18, 1916.	*San Francisco	11,333
Komakata Maru .....	Feb. 19, 1916.	New York	2,133
Machao .....	Feb. 21, 1916.	*Seattle	8,266
Machao .....	Feb. 23, 1916.	*New York	40,266
Machao .....	Feb. 23, 1916.	*San Francisco	6,666
Machao .....	Feb. 23, 1916.	*Seattle	2,133
Teiresias .....	Feb. 23, 1916.	Akron	4,400
Teiresias .....	Feb. 25, 1916.	*New York	8,933
Teiresias .....	Feb. 25, 1916.	*Seattle	6,266
Teiresias .....	Feb. 25, 1916.	*Akron	35,733
Klang .....	Feb. 29, 1916.	†Seattle	22,400
Itala .....	Mar. 1, 1916.	*Akron	29,000
Malta .....	Mar. 9, 1916.	*Akron	11,200
Colombo Maru .....	Mar. 12, 1916.	*San Francisco	11,200

Totals from Penang.....199,929

	From Singapore.	To.	Pounds.
Teiresias .....	Mar. 2, 1916.	*Seattle	705,600
Teiresias .....	Mar. 2, 1916.	*Akron	330,533
Itala .....	Mar. 5, 1916.	*Akron	313,600
Itala .....	Mar. 5, 1916.	*New York	324,533
Knight Companion .....	Mar. 9, 1916.	New York	11,200

Totals from Singapore.....1,685,466

## GUTTA JELUTONG (PONTIANAK).

Teiresias .....	Mar. 2, 1916.	*Seattle	19,200
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\*Via Hongkong. †Via Singapore.

## COMPARATIVE NEW YORK PRICES FOR MAY.\*

The market for Commercial Paper has continued very steady for some months past, and there has been no special change in May, the best rubber names still selling freely at 4@4½ per cent, and those not so well known 5@5½ per cent, according to grade.

	1916.	1915	1914.
Upriver, fine .....	\$0.67@0.72	\$0.59@0.61	\$0.70@0.74
Upriver, coarse .....	.50@.54	.45@.46	.42@.46
Islands, fine .....	.61@.67	.52@.54	.60@.72
Islands, coarse .....	.30@.37	.29@.31	.29@.32
Cametá .....	.35@.38	.32@.34	.33@.37

\*Figured only to May 26.

## SINGAPORE.

GUTHRIE &amp; CO., LIMITED, report [April 13, 1916]:

For the second week in succession prices ruling at the auction held yesterday and continued today were above London parity. Demand throughout was good and values of most grades were higher on the week.

Fine pale crépe fetched the top price of the sale—one very fine lot selling for \$183, an increase of \$3. Fine ribbed smoked sheet sold up to \$182, this being \$1 higher than last week's best. Unsmoked sheet met with a good inquiry, ribbed and plain selling up to \$168 and \$165, respectively. Brown and dark crépes sold readily at an average increase of \$2 per picul. Scraps shared in the general improvement.

About 400 tons were offered for sale and of this quantity about 280 tons changed hands.

The following was the course of values:

	In Singapore per picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.†
Sheet, fine ribbed smoked.....	\$175@182	3/ 4½ @ 3/ 5¼	81.59@84.63
Sheet, good ribbed smoked.....	168@175	3/ 2¼ @ 3/ 4¼	78.55@81.59
Sheet, plain smoked.....	170@175	3/ 3¼ @ 3/ 4¼	79.56@81.59
Sheet, ribbed, unsmoked.....	159@168	3/ 0¾ @ 3/ 2¼	74.75@78.55
Sheet, plain unsmoked.....	155@165	3/ 0 @ 3/ 2¼	72.98@77.28
Crépe, fine pale .....	176@183	3/ 4½ @ 3/ 6	82.10@85.14
Crépe, good pale .....	174@177	3/ 4 @ 3/ 4½	81.08@82.35
Crépe, fine brown .....	170@175	3/ 3¼ @ 3/ 4¼	79.56@81.59
Crépe, good brown .....	155@169	3/ 0 @ 3/ 3	72.98@79.06
Crépe, dark .....	147@159	2/ 10¼ @ 3/ 0¾	69.68@74.75
Crépe, bark .....	125@148	2/ 5¼ @ 2/ 10¼	60.31@70.18
Scrap, virgin .....	95@132	1/ 11½ @ 2/ 7¼	47.64@63.35
Scrap, pressed .....	100@128	2/ 0½ @ 2/ 6¾	49.66@61.57
Scrap, loose .....	90@121	1/ 10¼ @ 2/ 4¾	45.35@58.53

\*Picul = 133½ pounds.

†Figured at standard rate of exchange, 1s. = 24.3 cents.

Quoted in S. S. dollars = 2/4 [56.7 cents].

## PLANTATION RUBBER FROM THE FAR EAST.

## TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore.	From Malacca.	From Penang.	From Port Swet.	Totals.
	29, 1916.	29, 1916.	29, 1916.	7, 1916.	
United Kingdom.....	4,574,766	931,200	4,482,933	7,064,542	17,053,441
The Continent .....	2,359,692		20,667		2,380,359
Japan .....	611,183				611,183
Ceylon .....	45,816		148,133	532,812	726,761
United States .....	14,169,718		1,294,534		15,464,252
Australia .....	52,527				52,527
Totals .....	21,813,702	931,200	5,946,267	7,597,354	36,288,523
For same period, 1915 .....	10,084,539	1,385,559	4,135,865	7,910,027	23,515,990
For same period, 1914 .....	6,021,559		3,717,200	7,599,973	17,338,732
For same period, 1913 .....	3,220,225		2,110,666	7,604,588	12,935,379

## EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to April 10, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States .....	3,130,970	9,183,739
Canada and Newfoundland.....	340,140	2,240
France .....	82,454	429,850
Russia .....	204,353	78,400
United Kingdom .....	8,317,966	6,074,758
Australia (Aukon) .....	43,486	229,300
India .....	500	550
Straits Settlements .....	98,376	62,196
Japan .....	142,015	

Totals .....

(Same period 1914, 9,269,802 pounds; same period 1913, 6,248,782.) The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 846,937 pounds from the Straits Settlements and 254,295 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MADURA.

PLANTATION, TO—	1914.	1915.	1916.
Holland .....	Ficus .....	3,108	3,889
	Hevea .....	214,409	99,420
	Hevea (to order) .....	54,263	2,266
	Manihot (Ceara) .....	757	
	Castilloa .....	6,329	
Totals .....	278,866	105,575	
Great Britain .....	Ficus .....	26,629	1,505
	Hevea .....	189,603	427,020
	Castilloa .....	7,608	10,408
Totals .....	224,040	438,933	463,419
Singapore .....	Ficus .....		374
	Hevea .....	19,430	25,586
	Manihot (Ceara) .....	260	
	Castilloa .....		2,255
Totals .....	19,690	25,960	211,183
United States .....	Ficus .....		3,439
	Hevea .....	20,064	188,795
	Manihot (Ceara) .....		4,554
Totals .....	20,064	188,795	876,709
Belgium .....	Ficus .....	361	
	Hevea .....	43,329	
Totals .....	43,690		
Germany .....	Castilloa .....	1,542	
Japan .....	Hevea .....	19,554	32,837
Other Europe .....	Hevea .....	6,285	
Other countries .....	Hevea .....		532
Grand Totals .....	594,177	778,817	1,584,680

GUTTA PERCHA, TO—		
Singapore .....	120,296	90,882
GUTTA JELUTONG, TO—		
Singapore .....	1,584	1,606

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the Colonial Secretary, Singapore, notifies that the export of plantation rubber from Straits Settlements ports in the month of March amounted to 4,481 tons compared with 3,359 tons in February and 2,477 tons in the corresponding month last year. The total export for the first quarter amounted to 12,283 tons, against 7,794 tons in 1915 and 4,169 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January .....	1,181	2,576	4,443
February .....	1,703	2,741	3,359
March .....	1,285	2,477	4,481
Totals .....	4,169	7,794	12,283

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur reports that the export of plantation rubber from the Federated Malay States for the month of April amounted to 3,904 tons, compared with 4,429 tons in March and 2,877 tons in the corresponding month last year. The total export for the first four months of the current year amounts to 18,011 tons against 13,079 tons for the corresponding period of 1915 and 9,475 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January .....	2,542	3,473	4,471
February .....	2,364	3,411	5,207
March .....	2,418	3,418	4,429
April .....	2,151	2,777	3,904
Total .....	9,475	13,079	18,011

## IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

## IMPORTS.

From—	February, 1916.					March, 1916				
	Pará Rubber.	Pará Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.	Pará Rubber.	Pará Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Federated Malay States—										
Port Swettenham .....	831,196					1,817,733	416,800			
Teluk Anson .....	547,066					940,600	6,533			
Muar .....	412,133	9,066				679,200	53,866			
Kelantan .....	72,666					88,933				
Port Dickson .....	64,133	50,266				88,766	133,600			
Kuantan .....	32,266					38,000			266	
Mersing .....	11,733					7,200	4,266			
Rengat .....	3,600					11,066				
Pahang .....	1,600									
Tringganu .....	133					400				
Totals .....	1,976,526	59,332				3,671,898	615,065		266	
Sumatra—										
Bandjermassin .....	48,400	13,333	48,000	89,600	173,333	26,266	26,666	5,066	52,933	55,393
Indragiri .....	13,470	27,866			4,666	4,666	21,866			40,030
Pasir .....	7,466		133	4,000		13,733		400		
Siak .....	5,600					6,000				
Palembang .....	3,466				326,666	3,466	33,866			767,600
Asahan .....	3,066					3,200				
Belawan .....		160,933					129,866			
Benkoelen .....						5,333				
Muntok .....						1,333				
Bengkalis .....						533				
Port Bon .....			3,333	4,666	7,733			931	7,463	13,333
Totals .....	81,468	202,132	51,466	98,266	512,398	64,500	212,264	6,397	60,396	876,326
Borneo—										
Sarawak .....	56,400	40,266		31,066	676,533	42,133	35,600		4,400	580,933
Pontianak .....	25,333	1,733	4,800	4,266	16,533	81,333	4,934	5,066	4,533	15,066
Sibu .....	13,600		533	9,202	92,400	31,866		1,333	2,533	272,933
Sambas .....	10,666			533	4,266	23,466			9,333	88,400
Singkawang .....	800					5,066				
Samarinda .....			18,533	3,600		1,866		8,533	1,600	
Sampit .....				6,666	173,333					
Totals .....	106,799	41,999	23,866	55,333	963,065	185,730	40,534	14,932	22,399	957,332
British North Borneo—										
Labuan .....	13,733			5,733	22,933	21,333	8,800	133	7,866	137,600
Jesseltan .....	9,866	74,000		6,933	85,200	39,600	235,866			
Sandakan .....	2,133	4,933				18,666	34,000	800		
Kudat .....		14,266				9,866	23,200			
Totals .....	25,732	93,199		12,666	108,133	89,465	301,866	933	7,866	137,600
Straits Settlements—										
Penang .....	786,266	85,600				939,066	2,800			
Malacca .....	351,866	445,866				531,866	575,863			
S. Pandjang .....	4,266					4,800				
Totals .....	1,142,398	531,466				1,475,732	578,663			
Java—										
Batavia .....	122,800					86,533				
Deli .....	73,866	318,933				88,666	286,133			
Sourabaya .....	8,800					99,733				
Totals .....	205,466	318,933				274,932	286,133			
Burma—										
Mergui .....	49,733					6,000				
Rangoon .....	4,133					8,800				
Totals .....	53,866					14,800				
Siam—										
Bangkok .....				8,266		400			7,733	
Patani .....						1,200			266	
Totals .....				8,266		1,600			7,999	
Natunas and Anambas Islands .....	93,733					266				
Djambi .....	100,533	3,333		3,333		186,000		933	7,600	23,330
Other ports .....	236,666	184,266	4,800	19,600	104,400	244,800	110,800	400	5,466	192,533
Grand Totals .....	4,023,187	1,431,327	80,132	197,464	1,687,996	6,209,723	2,145,325	23,595	111,992	2,187,121

## EXPORTS.

To—	February, 1916.					March, 1916				
	Pará Rubber.	Pará Rubber Transhipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.	Pará Rubber.	Pará Rubber Transhipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
EUROPE:										
United Kingdom—										
England—										
London .....	742,133	917,700		216,266		1,049,736	1,369,466		156,000	109,733
Liverpool .....	222,933	294,800		90,666	67,733	33,466	13,600			
Scotland (Glasgow) .....									22,800	
France (Marseilles) .....			11,200		10,400	49,333		21,333	8,133	
Russia (Vladivostok) .....	732,666					1,759,466				33,733
Italy (Genoa) .....						100,933				
Totals .....	1,697,732	1,212,500	11,200	306,932	78,133	2,992,934	1,383,066	21,333	186,933	143,466
NORTH AMERICA:										
United States—										
New York .....	3,137,333	383,066	18,000	227,333	589,733	2,499,866	975,466	11,200	101,200	817,200
Seattle .....	703,866	15,733			39,466	938,666	47,166		74,666	2,488,000
Akron .....	352,933	246,933				2,112,666	41,866			
San Francisco .....	176,666									27,333
Boston .....	150,133			44,800	155,600	4,533	8,933			199,333
Canada—										
Ontario .....						31,200				
Vancouver .....						94,000				
Totals .....	4,520,931	645,732	18,000	272,133	784,799	5,680,931	1,073,431	11,200	175,866	3,531,866
Grand Totals .....	6,218,663	1,858,232	29,200	579,065	862,932	8,673,865	2,456,497	32,533	362,799	3,675,332

## CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weights in Pounds.]

APRIL 22.—By the steamer *Boniface* from Pará and Manãos:

	Fine.	Medium.	Coarse.	Cauch.	Total.
Meyer & Brown.....	22,100	7,400	49,400	163,000=	241,900
General Rubber Co.....	400,700	44,200	140,700	122,000=	707,600
Arnold & Zeiss.....	102,300	7,400	131,800	150,500=	392,000
Henderson & Korn.....	60,600	14,200	141,400	22,300=	238,500
R. Grace & Co.....	81,100	.....	.....	74,200=	155,300
Paul Bertuch.....	5,600	1,300	15,600	41,600=	64,100
H. A. Astlett & Co.....	9,800	25,900	38,600	4,100=	78,400
Pell & Dumont.....	16,100	3,000	18,900	33,500=	71,500
Hagemeyer & Brunn.....	56,000	.....	.....	.....	56,000
G. Amsinck & Co.....	10,000	1,100	16,500	26,500=	54,100
J. T. Johnstone & Co.....	9,600	2,100	6,800	16,100=	34,600
Raw Products Co.....	.....	.....	10,400	11,100=	21,500
Aldens' Successors, Ltd.....	.....	4,800	4,000	.....	8,800
Reisman & Hirst.....	.....	.....	.....	200=	200
Totals.....	773,900	111,400	574,100	665,100=	2,124,500

MAY 2.—By the steamer *Stephen* from Pará:

	Fine.	Medium.	Coarse.	Cauch.	Total.
Meyer & Brown.....	5,700	1,800	24,300	5,600=	37,400
Arnold & Zeiss.....	33,200	5,200	90,300	46,000=	174,700
General Rubber Co.....	.....	.....	73,000	.....	73,000
H. A. Astlett & Co.....	3,400	300	11,500	53,700=	68,900
J. T. Johnstone & Co.....	43,000	.....	12,100	.....	55,100
Paul Bertuch.....	9,600	.....	3,200	40,100=	52,900
Henderson & Korn.....	12,100	3,700	23,100	6,700=	45,600
Pell & Dumont.....	.....	.....	24,500	11,300=	35,800
Raw Products Co.....	.....	.....	8,600	.....	8,600
W. R. Grace & Co.....	3,500	1,300	.....	1,100=	5,900
Totals.....	110,500	12,300	270,600	164,500=	557,900

MAY 3.—By the steamer *Sao Paulo* from Pará:

	Fine.	Medium.	Coarse.	Cauch.	Total.
Meyer & Brown.....	82,400	4,800	66,200	124,700=	278,100
Arnold & Zeiss.....	32,300	14,600	35,300	92,400=	174,600
General Rubber Co.....	107,300	15,300	14,600	.....	137,200
Henderson & Korn.....	9,300	1,800	6,600	21,500=	39,200
G. Amsinck & Co.....	11,700	1,000	16,100	1,300=	30,200
Paul Bertuch.....	.....	.....	23,200	.....	23,200
H. A. Astlett & Co.....	.....	.....	12,500	8,200=	20,700

## PARAS.

## POUNDS.

APRIL 27.—By the <i>Christian Bors</i> =Montevideo:	
Muller, Schall & Co. (Fine)....	60,000
Muller, Schall & Co. (Coarse)...	2,000
MAY 8.—By the <i>Denis</i> =Maranhão:	
G. Amsinck & Co. (Cauch)...	35,000
Roesbach Bros. & Co. (Cauch)...	1,000
MAY 11.—By the <i>Panama</i> =Colon:	
W. R. Grace & Co. (Fine).....	9,000
MAY 18.—By the <i>Ancon</i> =Colon:	
W. R. Grace & Co. (Fine).....	6,000
W. R. Grace & Co. (Coarse)...	2,200
G. Amsinck & Co. (Fine).....	20,000
G. Amsinck & Co. (Coarse)...	3,200
Muller, Schall & Co. (Cauch)...	7,200
Neuss, Hesslein & Co. (Cauch)...	6,600

## CENTRALS.

[\*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

APRIL 24.—By the <i>Borglum</i> =Mexico:	
G. Amsinck & Co.....	2,000
Graham, Hinkley & Co.....	1,000
APRIL 24.—By the <i>Calamares</i> =Port Limon:	
Isaac Brandon & Bros.....	2,000
APRIL 27.—By the <i>Colon</i> =Colon:	
G. Amsinck & Co.....	10,100
J. S. Sembrada & Co.....	5,200
Camacho Roldan & Van Sichel..	2,400
Mecke & Co.....	3,200
Pablo Calvet & Co.....	3,000
Lanman & Kemp.....	3,200
A. M. Capen's Sons.....	6,500
R. G. Barthold.....	1,400
De Solo Bros. & Pardo.....	1,300
Muller, Schall & Co.....	1,400
Lawrence Johnson & Co.....	2,200
American Trading Co.....	800
Piza Nephews & Co.....	3,500
Rottberg, Ebeling & Co.....	1,500
Fidaque Bros. & Co.....	500

## POUNDS.

Isaac Brandon & Bros.....	500
Various.....	3,700
MAY 1.—By the <i>Esperanza</i> =Mexico:	
E. Steiger & Co.....	16,000
Lanman & Kemp.....	3,500
H. Marquardt & Co.....	3,000
American Trading Co.....	2,000
G. Amsinck & Co.....	1,500
General Export & Commission Co.	1,500
Mexican Hide Co.....	500
Pedro Tremari, Successor.....	500
MAY 1.—By the <i>Sirala</i> =Cortez:	
Eggers & Heinlein.....	2,000
G. Amsinck & Co.....	500
MAY 4.—By the <i>Advance</i> =Colon:	
Andean Trading Co.....	2,500
MAY 2.—By the <i>Tenadores</i> =Port Limon:	
Isaac Brandon & Bros.....	3,000
Stark & Co.....	3,000
A. Held.....	1,500
H. Marquardt & Co.....	200
MAY 9.—By the <i>Metapan</i> =Port Limon:	
Isaac Brandon & Bros.....	2,000
A. A. Linde & Co.....	1,500
De Lima, Cortisioz & Co.....	1,000
MAY 11.—By the <i>Panama</i> =Colon:	
G. Amsinck & Co.....	29,000
Lawrence Johnson & Co.....	10,000
Goldsmith & Co., Inc.....	3,400
Dumarest Bros. & Co.....	2,000
Isaac Brandon & Bros.....	1,000
Rottberg, Ebeling & Co.....	300
Various.....	1,000
MAY 12.—By the <i>Almirante</i> =Cartagena:	
Andean Trading Co.....	3,500
MAY 15.—By the <i>Monterey</i> =Mexico:	
E. Steiger & Co.....	35,000
H. Marquardt & Co.....	10,000
General Export & Commission Co.	7,000
Lanman & Kemp.....	2,000
J. A. Medina & Co.....	1,000

## POUNDS.

MAY 15.—By the <i>Tivies</i> =Cortez:	
A. Rosenthal & Sons.....	8,000
Eggers & Heinlein.....	500
J. S. Sembrada & Co.....	100
MAY 16.—By the <i>Pastores</i> =Port Limon:	
Fruit Dispatch Co.....	1,200
H. Marquardt & Co.....	200
Isaac Brandon & Bros.....	600
MAY 18.—By the <i>Allianza</i> =Colon:	
Fidaque Bros. & Co.....	3,000
Isaac Brandon & Bros.....	1,000
MAY 19.—By the <i>El Alba</i> =Galveston:	
Various.....	*40,000
MAY 19.—By the <i>Zacapa</i> =Cartagena:	
G. Amsinck & Co.....	20,000
Andean Trading Co.....	3,000
A. Held.....	1,500
American Trading Co.....	500

## AFRICANS.

APRIL 24.—By the <i>Sarnia</i> =Lisbon:	
S. R. Sequerra.....	112,000
APRIL 24.—By the <i>Rechambeau</i> =Bordeaux:	
Rubber Trading Co.....	23,520
Michelin Tire Co.....	22,500
APRIL 26.—By the <i>Idaho</i> =Hull:	
Robert Badenhop Co.....	13,500
APRIL 28.—By the <i>Orduna</i> =Liverpool:	
Robert Badenhop Co.....	55,000
J. T. Johnstone & Co.....	33,500
General Rubber Co.....	22,500
APRIL 28.—By the <i>Oreland</i> =Bordeaux:	
Rubber Trading Co.....	17,000
Various.....	25,000
MAY 1.—By the <i>Valeria</i> =Liverpool:	
Robert Badenhop Co.....	11,200
MAY 1.—By the <i>Celtic</i> =Liverpool:	
Rubber Trading Co.....	2,300
MAY 8.—By the <i>Hindoo</i> =Hull:	
J. T. Johnstone & Co.....	21,000

Neuss, Hesslein & Co.....	16,100	.....	.....	.....	16,100
F. D. Duerr Co.....	5,000	.....	600	.....	12,000
Totals.....	264,100	37,600	175,100	254,500=	731,300

MAY 8.—By the steamer *Denis* from Iquitos:

Meyer & Brown.....	.....	.....	105,500=	105,500
Commercial Bank of Spanish America.....	3,000	.....	3,400	229,100=
G. Amsinck & Co.....	19,100	1,800	7,900	82,700=
H. C. Kupper.....	24,200	.....	15,400	46,300=
H. A. Astlett & Co.....	18,900	.....	5,500	13,000=
W. R. Grace & Co.....	3,700	900	1,600	2,200=
J. T. Johnstone & Co.....	1,800	300	800	600=
Toledano Exporting Co.....	300	.....	1,800=	2,100
Totals.....	71,000	3,000	34,600	481,200=

MAY 8.—By the steamer *Denis* from Pará and Manãos:

Meyer & Brown.....	70,800	16,200	40,000	.....	127,000
General Rubber Co.....	161,000	25,600	53,100	170,700=	410,400
H. A. Astlett & Co.....	93,400	16,600	30,800	69,500=	210,300
Paul Bertuch.....	125,600	.....	39,500	2,700=	167,800
Arnold & Zeiss.....	53,800	6,700	40,500	5,000=	106,000
Henderson & Korn.....	33,600	.....	21,500	31,500=	86,600
Aldens' Successors, Ltd.....	2,600	6,500	12,900	300=	22,300
G. Amsinck & Co.....	1,400	400	4,700	.....	6,500
F. D. Duerr Co.....	4,000	600	400	400=	5,400
Hagemeyer & Brunn.....	2,600	100	700	400=	3,800
Totals.....	548,800	72,700	244,100	280,500=	1,146,100

MAY 18.—By the steamer *Atahualpa* from Pará and Manãos:

Meyer & Brown.....	25,100	5,300	46,700	16,900=	94,000
Arnold & Zeiss.....	63,000	13,800	75,400	4,600=	156,800
General Rubber Co.....	22,800	3,400	3,800	107,400=	137,400
H. A. Astlett & Co.....	7,100	16,700	55,600	8,100=	87,500
Henderson & Korn.....	37,500	.....	2,600	43,300=	83,400
Paul Bertuch.....	67,200	.....	800	9,200=	77,200
Robinson & Co.....	13,400	9,400	10,800	.....	33,600
Pell & Dumont.....	.....	.....	29,200	.....	29,200
Aldens' Successors, Ltd.....	.....	7,400	10,500	1,200=	19,100
Cowdrey & Co.....	3,000	.....	2,100	600=	5,700
W. R. Grace & Co.....	3,200	.....	.....	.....	3,200
Totals.....	242,300	56,000	237,500	191,300=	727,100



		POUNDS.			POUNDS.			POUNDS.
MAY 8.—By the <i>Finland</i> =Liverpool:			Rubber Trading Co.....		54,880	MAY 13.—By the <i>Manchuria</i> =London:		
Charles T. Wilson Co., Inc.....	11,200		Goodyear Tire & Rubber Co....	60,000		Alden's Successors, Ltd.....	168,500	
MAY 12.—By the <i>Colorado</i> =Hull:			Charles T. Wilson Co., Inc.....	25,000		L. Littlejohn & Co.....	103,282	271,782
Rubber Trading Co.....	4,900		Henderson & Korn.....	135,000	MAY 15.—By the <i>Manchuria</i> =London:			
MAY 12.—By the <i>Kroonland</i> =Liverpool:			Robinson & Co.....	2,200	Meyer & Brown.....	110,000		
F. Stern & Co.....	15,000		Alden's Successors, Ltd.....	15,690	General Rubber Co.....	160,000		
MAY 15.—By the <i>Philadelphia</i> =Liverpool:			Arnold & Zeiss.....	70,000	Alden's Successors, Ltd.....	135,000		
F. Stern & Co.....	18,000		Fox & Co.....	45,000	L. Littlejohn & Co.....	33,500		
MAY 15.—By the <i>Andania</i> =London:			F. Stern & Co.....	22,500	Charles T. Wilson Co., Inc.....	180,000		
Robinson & Co.....	15,000		Raw Products Co.....	9,000	W. R. Grace & Co.....	45,000		
Rubber Trading Co.....	17,240		Rumsey & Greutert Co., Inc....	4,500	Robert Badenhop Co.....	22,500		
MAY 17.—By the <i>Carpathia</i> =Liverpool:			J. T. Johnstone & Co.....	112,100	Raw Products Co.....	13,500	699,500	
General Rubber Co.....	22,500		L. Littlejohn & Co.....	271,944	MAY 15.—By the <i>Kandahar</i> =Colombo:			
MAY 17.—By the <i>Queen Margaret</i> =Liverpool:			Various.....	113,930	1,064,244	Meyer & Brown.....	285,000	
J. T. Johnstone & Co.....	33,500		APRIL 28.—By the <i>Queen Elizabeth</i> =Colombo:			L. Littlejohn & Co.....	135,945	
Rubber Trading Co.....	7,000	40,500	L. Littlejohn & Co.....	70,100		Arnold & Zeiss.....	33,500	
MAY 17.—By the <i>Waalidh</i> =Batavia:			Arnold & Zeiss.....	27,000	MAY 15.—By the <i>Andania</i> =London:			
General Rubber Co.....	140,000		Edward Maurer Co., Inc.....	22,500	Meyer & Brown.....	180,000		
Karl Schroder.....	60,000		Rubber Trading Co.....	13,440	General Rubber Co.....	260,000		
Various.....	6,000	206,000	J. T. Johnstone & Co.....	11,200	The B. F. Goodrich Co.....	224,000		
MAY 20.—By <i>La Drome</i> =Bordeaux:			APRIL 28.—By the <i>Siberia</i> =London:			J. T. Johnstone & Co.....	135,000	
Rubber Trading Co.....	13,000		Meyer & Brown.....	240,000	Arnold & Zeiss.....	65,000	899,000	
MANICORA.			Edward Maurer Co., Inc.....	45,000	Robinson & Co.....	15,000		
APRIL 22.—By the <i>Boniface</i> =Ceara:			W. H. Stiles.....	45,000	MAY 17.—By the <i>Carpathia</i> =Liverpool:			
Rosbach Bros. Co.....	16,000		Goodyear Tire & Rubber Co....	145,000	The B. F. Goodrich Co.....	27,000		
Various.....	9,000	25,000	General Rubber Co.....	100,000	General Rubber Co.....	6,000	33,000	
APRIL 28.—By the <i>Hermion</i> =Bahia:			L. Littlejohn & Co.....	121,622	MAY 17.—By the <i>Queen Margaret</i> =Liverpool:			
Various.....	15,000		Charles T. Wilson Co., Inc.....	120,000	Rubber Trading Co.....	9,000		
MAY 1.—By the <i>Terence</i> =Bahia:			Raw Products Co.....	10,000	MAY 17.—By the <i>Waalidh</i> =Batavia:			
Adolph Hirsch & Co.....	80,000		MAY 1.—By the <i>Lawcastrian</i> =London:			Meyer & Brown.....	150,000	
MAY 1.—By the <i>Terence</i> =Rio de Janeiro:			Goodyear Tire & Rubber Co....	135,000	Edward Maurer Co., Inc.....	185,000		
G. Amsinck & Co.....	38,000		L. Littlejohn & Co.....	11,299	G. Amsinck & Co.....	200,000		
MAY 2.—By the <i>Stephen</i> =Ceara:			J. T. Johnstone & Co.....	11,300	Raw Products Co.....	27,000		
Rosbach Bros. Co.....	14,500		Various.....	2,200	J. T. Johnstone & Co.....	116,000		
Various.....	72,000	86,500	MAY 2.—By the <i>Welsh Prince</i> =Singapore:		Henderson & Korn.....	9,000		
MAY 2.—By the <i>Stephen</i> =Pernambuco:			Meyer & Brown.....	60,000	Goodyear Tire & Rubber Co....	30,000		
Rosbach Bros. & Co.....	60,000		Edward Maurer Co., Inc.....	40,000	Manhattan Rubber Manufac-	ing Co.....	20,000	
MAY 8.—By the <i>Deniz</i> =Parnahyba:			Alden's Successors, Ltd.....	17,500	Alden's Successors, Ltd.....	22,500		
Rosbach Bros. & Co.....	9,500		Fox & Co.....	13,500	W. R. Grace & Co.....	33,500		
MAY 9.—By the <i>Tennyson</i> =Bahia:			Charles T. Wilson Co., Inc.....	30,000	Rubber Trading Co.....	121,000		
Adolph Hirsch & Co.....	45,000		Goodyear Tire & Rubber Co....	60,000	L. Littlejohn & Co.....	28,233		
MAY 15.—By the <i>Tocantins</i> =Bahia:			Henderson & Korn.....	13,500	Various.....	219,000	1,161,233	
Adolph Hirsch & Co.....	27,500		Robert Badenhop Co.....	33,600	MAY 17.—By the <i>Vandalia</i> =London:			
Rosbach Bros. & Co.....	15,000	42,500	J. T. Johnstone & Co.....	79,700	The B. F. Goodrich Co.....	225,000		
MAY 20.—By the <i>Cedric</i> =Liverpool:			L. Littlejohn & Co.....	59,052	F. Stern & Co.....	35,000		
Edward Maurer & Co., Inc.....	2,200		MAY 3.—By the <i>City of Durham</i> =Colombo:		J. T. Johnstone & Co.....	17,000		
PLANTATIONS.			Meyer & Brown.....	45,000	Raw Products Co.....	7,000	284,000	
APRIL 21.—By the <i>Monadnock</i> =London:			L. Littlejohn & Co.....	146,080	MAY 18.—By the <i>Menaba</i> =London:			
J. T. Johnstone & Co.....	115,000		Rubber Trading Co.....	22,400	W. R. Grace & Co.....	16,000		
Arnold & Zeiss.....	55,000		Robinson & Co.....	46,200	L. Littlejohn & Co.....	11,272	27,272	
Raw Products Co.....	1,100	171,100	Alden's Successors, Ltd.....	11,100	MAY 19.—By the <i>Manhattan</i> =London:			
APRIL 27.—By the <i>Toyohashi Maru</i> =London:			W. H. Stiles.....	56,000	Rubber Trading Co.....	25,000		
Henderson & Korn.....	70,000		Edward Maurer Co., Inc.....	11,200	Goodyear Tire & Rubber Co....	22,500		
APRIL 27.—By the <i>Kafue</i> =Colombo:			J. T. Johnstone & Co.....	9,000	L. Littlejohn & Co.....	11,305	58,305	
Meyer & Brown.....	95,500		W. R. Grace & Co.....	4,500	MAY 22.—By the <i>Oceano</i> =Colombo:			
L. Littlejohn & Co.....	52,630		Goodyear Tire & Rubber Co....	35,000	Meyer & Brown.....	225,000		
J. T. Johnstone & Co.....	11,200		Arnold & Zeiss.....	70,000	L. Littlejohn & Co.....	104,865		
Henderson & Korn.....	25,000		MAY 3.—By the <i>Pannonia</i> =London:		Arnold & Zeiss.....	27,000		
Arnold & Zeiss.....	55,000		General Rubber Co.....	250,000	Edward Maurer Co., Inc.....	33,500		
Edward Maurer Co., Inc.....	110,000		J. T. Johnstone & Co.....	113,000	Goodyear Tire & Rubber Co....	35,000		
Various.....	5,000	354,330	Arnold & Zeiss.....	65,000	W. H. Stiles.....	33,500		
APRIL 28.—By the <i>Orduna</i> =Liverpool:			Michelin Tire Co.....	33,600	J. T. Johnstone & Co.....	11,200	470,065	
Goodyear Tire & Rubber Co.....	2,200		Robinson & Co.....	33,600	MAY 23.—By the <i>Alania</i> =London:			
APRIL 28.—By the <i>Tucan Prince</i> =Singapore:			Rubber Trading Co.....	27,000	Meyer & Brown.....	225,000		
Meyer & Brown.....	40,000		L. Littlejohn & Co.....	11,008	General Rubber Co.....	335,000		
Edward Maurer Co., Inc.....	60,000		Henderson & Korn.....	13,500	Arnold & Zeiss.....	225,000		
F. B. Ross & Co.....	22,500		MAY 8.—By the <i>Finland</i> =Liverpool:		The B. F. Goodrich Co.....	220,000		
			Charles T. Wilson Co., Inc.....	2,200	Alden's Successors, Ltd.....	140,000		
			MAY 8.—By the <i>Vinotia</i> =London:		Charles T. Wilson Co., Inc.....	80,000		
			Alden's Successors, Ltd.....	505,000	J. T. Johnstone & Co.....	65,000		
			General Rubber Co.....	190,000	Robinson & Co.....	50,000		
			The B. F. Goodrich Co.....	125,000	Edward Maurer Co., Inc.....	50,000		
			L. Littlejohn & Co.....	71,628	Michelin Tire Co.....	45,000		
			J. T. Johnstone & Co.....	50,000	Henderson & Korn.....	11,200		
			Robinson & Co.....	33,500	Raw Products Co.....	4,500		
			W. R. Grace & Co.....	22,500	Robert Badenhop Co.....	2,000	1,452,700	
			Raw Products Co.....	22,500	CRUDE RUBBER ARRIVALS AT SEATTLE.			
			Arnold & Zeiss.....	25,000	[The Figures Indicate Weights in Pounds.]			
			F. Stern & Co.....	1,000	*Figured 130 pounds net to the case.			
			Edward Maurer Co., Inc.....	55,000	TO AKRON.			
			W. H. Stiles & Co.....	55,000	Consignee—			
			MAY 9.—By the <i>Philadelphia</i> =London:		Firestone Tire & Rubber Co.		Pounds.	
			Michelin Tire Co.....	60,000	The Waterhouse Co., Ltd....	182,780		
			W. R. Grace & Co.....	22,500	Bandar Sumatra Rubber Co..	2,080		
					Goodyear Tire & Rubber Co.			
					Glen Bervie Rubber Co., Ltd..	1,690		
					Jameing Rubber Estates.....	3,380		
					Serdang Central Plantations..	2,080		
					Angle Sumatra Rubber Co., Ltd.	5,330		
					Harrisons & Crossfield.....	265,460		
					Wadeleigh Co., Ltd.....	229,450		
					Lang Kat Sumatra Rubber Co.	6,240		

POUNDS.			POUNDS.		
Rubber Estates of Johor, Ltd.	30,550		Planters Stores & Agency Co.	9,100	
Anglo Malay Rubber Co.	56,030		The Penang Estate & Allied		
Penang Rubber Estate & Allied			Co.	11,050	
Cos.	11,440	796,510	L. Littlejohn & Co.		
<b>TO BOSTON.</b>			United Serdang Rubber Planta-		
Hood Rubber Co.			tion	3,250	
Penang Rubber Estate & Allied Cos...	6,440		Banstead & Co.	4,420	
<b>TO NEW YORK.</b>			The Penang Estate & Allied		
United States Rubber Co.			Co.	30,680	
General Rubber Co.	190,450		Grace Bros., for San Francisco.		
Henderson & Korn.			Sungai Regla Rubber Estate..	1,950	636,350
Sirdang Central Plant, Ltd.	1,690		Not given.		
Lang Kat Sumatra Rubber Co.	1,690		Geo. Stewart & Co.	35	pkgs.
Tameing Rubber Estates.	1,690		<b>MAY 13.—By the steamer Hawaii Maru:</b>		
Bandar Sumatra Rubber Co.	1,690		Consignee—		
United Serdang Rubber Planta-			<b>TO AKHON.</b>		
tions	1,690		The B. F. Goodrich Co.		
Rubber Trading Co.			W. I. Easley	507,000	
Anglo Sumatra Rubber Co.	1,430		The Firestone Tire & Rubber Co.		
Penang Rubber Estate & Allied			The Waterhouse Co.	172,510	679,510
Cos.	11,050		<b>TO NEW YORK.</b>		
J. T. Johnstone Co.			Henderson & Korn.		
Anglo Sumatra Rubber Co.	2,860		International Trade Co.	149,370	
Raw Product Co.			W. R. Grace & Co.		
Sealang Rubber Estate Co.	4,290		H. S. Godwin	38,350	
Arthur Meyer & Co.			Robert Badenhop Co., Inc.		
Anglo Sumatra Rubber Co.	2,860		British Consul General, New		
Penang Rubber Estate & Allied			York	18,980	206,700
Cos.	23,010		<b>CUSTOM HOUSE STATISTICS.</b>		
Arnold & Zeiss.			<b>PORT OF NEW YORK—FEBRUARY, 1916.</b>		
Tandjong Rubber Co.	2,730		<b>IMPORTS:</b>		
United Serdang Rubber Planta-			India rubber	17,253,139	\$11,267,202
tion	4,420		Balata	226,660	89,337
W. Mansfield & Co., Ltd.	4,160		Gutta percha	107,134	12,055
Goodyear Tire & Rubber Co.			Gutta jelutong (Pontianak).	1,108,055	59,380
United Serdang Rubber Planta-			Rubber scrap	514,792	43,229
tion	3,250		Totals	19,209,780	\$11,471,203
L. Littlejohn & Co.			<b>EXPORTS:</b>		
United Serdang Rubber Planta-			India rubber	289,219	\$147,569
tion	7,800		Balata	147,910	51,199
Herbert Symons & Co.			Totals	437,129	\$198,768
Weller & Co.	203,190		<b>PORT OF NEW YORK—MARCH, 1916.</b>		
British Consul General.			<b>IMPORTS:</b>		
General Rubber Co.	496,340		India rubber	23,859,096	\$15,743,781
Schneid, Schudel & Co.	24,440		Balata	265,240	107,034
Penang Rubber Estate & Allied			Gutta percha	210,325	26,606
Cos.	2,210		Gutta jelutong (Pontianak).	1,090,140	73,016
Charles T. Wilson & Co.			Rubber scrap	1,171,484	93,253
Penang Rubber Estate & Allied			Totals	26,596,285	\$16,043,690
Cos.	11,050		<b>EXPORTS:</b>		
Robinson & Co., New York.			India rubber	20,000	\$10,080
G. H. Slet & Co.	8,450	1,012,440	Balata	55,484	26,996
<b>TO SEATTLE.</b>			Totals	75,484	\$37,076
The B. F. Goodrich Co.			<b>PORT OF BOSTON—MARCH, 1916.</b>		
W. T. Easley	351,650		<b>EXPORTS:</b>		
Henderson & Korn.			Rubber scrap	11,423	\$1,003
East Asiatic Co., Ltd.	34,060		Manufactures of india rubber		101,518
Goodyear Tire & Rubber Co.			Totals	11,423	\$102,521
C. Mackie & Co.	147,940		<b>PORT OF BOSTON—APRIL, 1916.</b>		
The Buket Cloh Rubber Co.	3,640		<b>IMPORTS:</b>		
Banstead & Co.	4,160		India rubber	145,600	\$120,002
W. R. Grace & Co.			Gutta percha	22,421	1,941
Guthrie & Co., Ltd.	21,710		Gutta jelutong (Pontianak).	257,220	9,404
Mansfield & Co.	3,250		Manufactures of india rubber		4,250
Ulu Plantation Rubber Estates	4,550		Totals	425,241	\$135,597
H. B. C., New York.			<b>PORT OF CLEVELAND—APRIL, 1916.</b>		
Cheras Rubber Estates, Ltd.	2,470		<b>IMPORTS:</b>		
W. R. Grace & Co.			India rubber	690,608	\$486,112
The Sungei Puren Rubber Co.	2,470		<b>PORT OF DETROIT—APRIL, 1916.</b>		
			<b>IMPORTS:</b>		
			Rubber scrap	380	\$11
			<b>EXPORTS:</b>		
			Rubber scrap	30,004	\$900
			Reclaimed rubber	14,242	2,453
			Totals	44,246	\$3,353
			<b>PORT OF HUBON—APRIL, 1916.</b>		
			<b>EXPORTS:</b>		
			Rubber scrap	30,004	\$900
			India rubber boots.... (pairs)	1,740	4,180
			Automobile tires		119
			Other rubber tires		986
			Beltting, hose, etc.		96
			Other manufactures of india		2,193
			rubber		
			Totals	31,744	\$8,474
			<b>PORT OF NEW ORLEANS—APRIL, 1916.</b>		
			<b>IMPORTS:</b>		
			India rubber	79,199	\$34,224
			<b>EXPORTS:</b>		
			Automobile tires		\$1,185
			Other rubber tires		106
			Beltting, hose, etc.		1,357
			All other manufactures of		
			india rubber		804
			Totals		\$3,452
			<b>PORT OF PHILADELPHIA—APRIL, 1916.</b>		
			<b>IMPORTS:</b>		
			Manufactures of india rubber.		\$448
			<b>EXPORT:</b>		
			Manufactures of india rubber.		\$7
			<b>PORT OF SAN FRANCISCO—APRIL, 1916.</b>		
			<b>IMPORTS:</b>		
			India rubber	692,495	\$561,370
			Gutta percha		670
			Manufactures of india rubber		270
			Totals	692,495	\$562,310
			<b>EXPORTS:</b>		
			Reclaimed rubber	23,437	\$2,385
			India rubber boots.... (pairs)	165	898
			India rubber shoes.	9,475	5,764
			Automobile tires		101,911
			Other rubber tires		23,192
			Beltting, hose, etc.		21,784
			All other manufactures of		
			india rubber		17,374
			Totals	33,077	\$173,308

## EXPORTS OF INDIA RUBBER FROM MANAOS DURING MARCH, 1916.

EXPORTERS.	NEW YORK.					EUROPE.					Grand Totals.
	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	
Suter & Co.	121,804	11,094	47,498	62,490	242,886	83,658	9,917	2,098	58,250	153,923	396,809
General Rubber Co.	146,520	19,266	65,290	117,924	349,000	61,671	24,124	1,377	98,743	185,915	534,915
I. G. Aranjó	80,696	10,390	45,231	35,126	171,443	61,868	10,492	21,689	7,067	101,116	272,559
Pralow & Co.	34,987	2,499	4,489		41,975	138,130	7,620	5,155	72,645	223,550	265,525
Tancredto Porto & Co.	38,566	21,890	32,110	38,917	131,483	42,988	24,312	10,075	30,366	107,741	239,224
Armazens Andresen	36,436	5,026	11,990	32,912	86,364						86,364
Mendes & Co.	20,320		400	100	20,820	12,819	7,520	1,583	5,146	27,068	47,888
Adelbert H. Alden, Limited.		3,291	4,447		7,738	16,744			20,451	37,195	44,933
Stowell & Sons						12,603	974	483	11,753	25,813	25,813
Gaspar Almeida & Co.	4,751	524	3,695	12,631	21,601						21,601
Semper & Co.	7,676	823	9,362	1,824	19,685						19,685
Ferra d'Oliveira & Sobo.				17,968	17,968						17,968
Sinfronio & Co.	8,778	1,201	3,277	335	13,591						13,591
Amorim Irmãos						7,680	800	2,760	1,650	12,890	12,890
Gomes & Co.						3,884			4,709	8,593	8,593
Totals	500,534	76,004	227,789	320,227	1,124,554	442,045	83,759	45,220	310,780	883,804	2,008,358
Sundries	1,789	232	791	255	3,067	8,275	1,270	3,813	7,868	21,226	24,293
Totals: March, 1916	502,323	76,236	228,580	320,482	1,127,621	450,320	87,029	49,033	318,648	905,030	2,032,651
February, 1916	546,003	82,739	191,537	205,419	1,025,698	164,400	27,819	56,344	119,229	367,792	1,393,490
January, 1916	561,143	110,411	176,779	148,142	996,475	543,822	58,574	75,105	123,703	801,204	1,797,679

(Compiled by Suter &amp; Co., Manaoas.)

## IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

Week Ending—	India Rubber.		Scrap for Re-manufacture.		Balata.		Gutta Jelutong.		Gutta Percha.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
April 21, 1916.....	5,169,015	\$3,442,588	125,317	\$14,663	44,717	\$25,010	1,016,919	\$45,959	56,040	\$5,934
April 28, 1916.....	6,234,190	4,014,738	115,409	8,246	30,684	10,856	361,556	19,099	76,410	9,793
May 5, 1916.....	6,659,563	4,188,167	138,791	9,554	17,219	6,591	308,797	19,035	408,970	19,846
May 12, 1916.....	3,830,594	2,287,292	159,363	9,841	33,515	17,303	.....	.....	.....	.....

## EXPORTS.

FIGURES ISSUED FROM APRIL 25, 1916, TO MAY 23, 1916.

EXPORTED TO—	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cables.	Other mnf. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
EUROPE:											
Denmark .....							\$988		\$170		
France .....	\$1,556		\$8,031		\$18,094	\$13,918	35,674		3,000	\$19,600	\$5,406
Greece .....							1				
Italy .....	523	\$15	131	\$1,431	38,805	3,525	8,170	\$1,748			
Netherlands .....	102			801		2,015	16	683			
Norway .....	1,006			900		25,300	430	204			
Portugal .....	16	6		20,190	475	2,136	900	189			
Russia in Europe .....				202	15,489	816	230	16			
Spain .....				90		12,124	1,398	240			
Sweden .....							156				
United Kingdom—											
England .....	32,119	197	35,244	252,912	10,887	66,056	235,135	1,681	6,300	9,063	8,886
Scotland .....	7		3,067	2,869			2,125				6,887
Totals, Europe .....	\$35,329	\$218	\$46,473	\$279,395	\$83,750	\$125,890	\$285,223	\$4,761	\$9,470	\$28,663	\$21,179
NORTH AMERICA:											
Bermuda .....	\$80		\$32		\$230		\$102	\$8	\$98		
British Honduras .....							77				
Canada .....						\$226	101				
Central American States—											
Costa Rica .....	88			\$355		1,167	552	147	300		
Guatemala .....	644			28	894		594				
Honduras .....	121			158		195	816	9			
Nicaragua .....	90						746		200		
Panama .....	2,430		765	6,660	1,057	29,346	4,213	43	978		
Salvador .....	644			236		72	1,190				
Mexico .....	11,466		77	7,616	2,475	2,875	1,442				
Newfoundland .....	71	\$2,768	1,270	176		580	912	14	87		
West Indies—											
British—											
Barbados .....	30		55	456			180	4			
Jamaica .....	237			4,177	47	68	610				
Trinidad and Tobago .....	179			1,243			745	535			
Other British .....	1,311			1,831	396		480	4			
Cuba .....	9,964		771	42,086	28,103	38,560	24,812	409	360		
Danish .....	69			108	16	90	17		21		
Dutch .....	10		4	489		7		550	6		
French .....				372	14		31	32			
Haiti .....	126			76			78	234			
Santo Domingo .....	203	48	125	2,490	645		612	16	49		
Totals, North America...	\$27,763	\$2,816	\$3,099	\$68,557	\$33,887	\$73,186	\$38,310	\$2,005	\$2,103		
SOUTH AMERICA:											
Argentina .....	\$8,899		\$394	\$36,163	\$3,237	\$4,103	\$24,425	\$547	\$317	\$1,200	
Bolivia .....	54			10,104		73					
Brazil .....	4,676		800	9,827	5,786	10,348	17,273	1,514			
Chile .....	1,491		3,794	2,156	118	22,442	1,477				
Colombia .....	1,055		21	3,008	595	2,023	2,553	23			
Ecuador .....	1,047			237		879	661				
Guiana—British .....	1,925			124			50				
Dutch .....							226				
French .....			68								
Peru .....	2,169	\$2,135		429	339	5,514	584		27		
Uruguay .....	936		3,284	11,164			2,335				
Venezuela .....	446			3,569	441	867	2,397				
Totals, South America...	\$22,698	\$2,135	\$8,361	\$81,781	\$10,516	\$46,249	\$51,981	\$2,084	\$344	\$1,200	
ASIA:											
China .....	\$122		\$1			\$2,832	\$574		\$20		
British East Indies—											
British India .....	609	\$461		16,949	\$8,832	14,273	3,514	\$48			
Dutch East Indies .....	4,653		129	2,464		4,089	4,218	648			
Hongkong .....	150			55			125				
Japan .....	323		716			1,128	560				
Totals, Asia .....	\$5,857	\$461	\$846	\$19,468	\$8,832	\$22,322	\$8,991	\$696	\$20		
OCEANIA:											
British—											
Australia and Tasmania .....	\$1,856		\$6,677	\$5,081	\$1,253	\$10,931	\$13,067		\$1,816		
New Zealand .....	511	\$95	535	6,575	74	37	2,387		20		
Philippine Islands .....	3,897			2,954	4,677	1,441	6,440	\$335			
Totals, Oceania .....	\$6,264	\$95	\$7,212	\$14,610	\$6,004	\$12,409	\$21,894	\$335	\$1,836		
AFRICA:											
British Africa—											
South .....	\$20,724	\$714	\$699	\$26,606	\$206	\$5,291	\$6,297		\$222		
Egypt .....							76				
Totals, Africa .....	\$20,724	\$714	\$699	\$26,606	\$206	\$5,291	\$6,373		\$222		



## RUBBER STATISTICS FOR THE UNITED STATES.

## IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(free):	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber:				
From France .....	146,451	\$85,651	303,315	\$160,874
Portugal .....	282,096	129,537	1,990,107	752,937
United Kingdom .....	5,637,264	4,590,909	47,823,798	29,551,401
Central America and British Honduras..	115,552	55,444	793,037	355,603
Mexico .....	705,252	321,196	1,995,590	780,764
Brazil .....	5,404,583	3,234,746	34,304,930	14,914,826
Other South America	568,580	303,102	4,457,859	1,997,405
East Indies .....	8,703,402	4,806,369	67,278,057	35,925,696
Other countries .....	208,173	181,205	614,226	427,481
Totals .....	21,771,355	\$13,698,159	159,560,919	\$84,866,987
Balata .....	226,660	\$89,337	1,781,831	\$682,244
Guayule gum .....	199,189	68,972	1,803,978	597,465
Gutta jelutong .....	1,423,655	73,992	16,453,995	718,157
Gutta percha .....	186,000	19,406	1,606,914	174,105
Totals .....	23,806,859	\$13,949,866	181,207,637	\$87,038,958
Rubber scrap .....	1,425,322	\$125,029	10,938,869	\$838,306
Totals, unmanufactured..	25,232,181	\$14,074,895	192,146,506	\$87,877,264
Chicle .....	757,002	\$297,840	4,726,709	\$1,717,682
MANUFACTURED—(dutiable):				
Gutta percha .....		\$1,150		\$6,931
India rubber .....		29,495		202,151
Totals, manufactured ..		\$30,645		\$209,082
Substitutes—elasticon, etc.		\$2,022		\$13,385

## EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
To Russia in Europe.....		\$620,350		\$1,086,070
England .....		392,285		5,857,732
Canada .....		145,416		882,310
Mexico .....		41,340		170,319
Cuba .....		40,713		309,351
Australia .....		149,736		946,624
New Zealand .....		158,661		565,458
Philippine Islands .....		53,716		221,296
Other countries .....		385,684		1,705,095
Totals .....		\$1,987,901		\$11,744,255
All other tires.....		\$230,862		\$2,015,470
Belting, hose and packing...		308,122		1,773,633
Rubber boots .....		110,446		603,111
Rubber shoes .....		79,464		1,277,931
Scrap and old rubber.....		366,133		2,635,918
Reclaimed rubber .....		419,404		4,317,606
Other rubber manufactures...		629,322		4,057,758
Totals, manufactured ..		\$3,474,126		\$22,490,993
Fountain pens .....	23,219	\$12,034	109,704	\$98,297

## EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Balata .....	147,900	\$51,199	343,987	\$129,585
Guayule gum .....			18,500	7,770
Gutta jelutong .....			2,773	305
Gutta percha .....	2,250	2,025	52,890	11,376
India rubber .....	769,467	446,387	3,238,736	1,794,279
Rubber scrap and refuse....			9,204	734
Totals, unmanufactured..	919,617	\$499,611	3,673,090	\$1,944,049
Chicle .....	10,100	\$3,445	109,006	\$31,786
MANUFACTURED—				
Gutta percha .....		\$55		\$240
India rubber .....		29,518		37,113
Totals, manufactured ..		\$29,573		\$37,353

## EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belting, hose and packing		\$3,688		\$75,081
Boots and shoes..(pairs)	2,056	4,526	41,996	106,579
Other rubber goods.....		1,919		21,377
Totals .....		\$10,133		\$203,037
To Hawaii:				
Belting, hose and packing		\$4,844		\$58,613
Automobile tires .....		38,973		350,164
Other tires .....		13,337		49,670
Other rubber goods.....		7,989		59,325
Totals .....		\$65,142		\$517,772

## To Philippine Islands:

Belting, hose and packing .....	\$12,713		\$35,801
Boots and shoes..(pairs) .....		16,705	14,690
Tires .....	70,360		260,109
Other rubber goods.....	15,878		121,806
Totals .....	\$98,951		\$432,406

## To Porto Rico:

Belting, hose and packing .....	\$1,884		\$27,626
Automobile tires .....	36,652		250,441
Other tires .....	11,242		24,937
Other rubber goods.....	4,821		43,366
Totals .....	\$54,599		\$346,370

## RUBBER STATISTICS FOR CANADA.

## IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(free):	February, 1916.		Eleven Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude caoutchouc or india rubber:				
From Great Britain .....	399,633	\$354,357	4,445,894	\$2,577,995
United States .....	479,402	313,811	4,097,726	2,221,218
Straits Settlements .....			22,574	11,659
Other countries .....			232,045	106,318
Totals .....	879,035	\$668,168	8,798,239	\$4,917,190
Rubber, re-covered:				
From Great Britain .....			4,392	\$2,482
United States .....	398,878	\$53,358	4,324,783	558,042
Totals .....	398,878	\$53,358	4,329,175	\$560,524
Hard rubber, in sheets and rods:				
From Great Britain .....			2,302	\$1,404
United States .....	3,687	\$1,909	158,633	19,640
Totals .....	3,687	\$1,909	160,935	\$21,044
Rubber substitute:				
From Great Britain .....			16,644	\$1,812
United States .....	21,601	\$1,624	473,271	36,818
Totals .....	21,601	\$1,624	489,915	\$38,630
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain .....			7,314	\$579
United States .....	81,351	\$9,942	1,088,733	70,846
Other countries .....	80	4	15,594	644
Totals .....	81,431	\$9,946	1,111,641	\$72,039
Rubber thread, not covered:				
From United States .....	6,015	\$8,124	31,754	\$43,424
Balata, crude:				
From United States .....			1,644	\$991
Chicle, crude:				
From Great Britain .....			2,888	\$1,675
United States .....	17,510	\$5,779	259,661	98,690
British Honduras .....	168,379	63,267	1,133,905	420,085
Mexico .....			305,929	113,023
Totals .....	185,889	\$69,046	1,702,383	\$633,473

MANUFACTURED—(dutiable):	February, 1916.		Eleven Months Ending February, 1916.	
	General Tariff. Value.	Preferential Tariff. Value.	General Tariff. Value.	Preferential Tariff. Value.
Waterproof clothing:				
From Great Britain .....		\$18,932	\$3,454	\$301,906
United States .....	\$19,188		109,140	
Other countries .....			63	
Totals .....	\$19,188	\$18,932	\$112,657	\$301,906
Hose, lined with rubber:				
From Great Britain .....		\$16		\$545
United States .....	\$10,352		\$71,488	
Totals .....	\$10,352	\$16	\$71,488	\$545
Mats and matting:				
From Great Britain .....				\$121
United States .....	\$316		\$2,523	
Totals .....	\$316		\$2,523	\$121
Packing:				
From Great Britain .....		\$10	\$201	\$1,209
United States .....	\$7,301		48,828	
Totals .....	\$7,301	\$10	\$49,029	\$1,209
Tires of rubber for all vehicles:				
From Great Britain .....		\$1,145	\$14,102	\$24,027
United States .....	\$164,314		1,287,476	
France .....			16,437	
Other countries .....			1,817	
Totals .....	\$164,314	\$1,145	\$1,319,832	\$24,027

\*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:

From Great Britain .....	\$5	\$26,386	\$2,421	\$159,339
United States .....	69,499	.....	543,641	.....
Other countries .....	376	.....	1,064	.....
Totals .....	\$69,880	\$26,386	\$547,126	\$159,339
Hard rubber, in tubes:				
From United States .....	\$1,180	.....	\$4,376	.....
Boots and shoes:				
From Great Britain .....	.....	\$12	.....	\$11,558
United States .....	\$7,698	.....	\$80,866	.....
Other countries .....	.....	.....	10	.....
Totals .....	\$7,698	\$12	\$80,876	\$11,558
Belting:				
From Great Britain .....	.....	.....	.....	\$1,172
United States .....	\$4,710	.....	\$47,672	.....
Totals .....	\$4,710	.....	\$47,672	\$1,172
Webbing—over one inch wide:				
From Great Britain .....	.....	\$742	\$78	\$12,247
United States .....	\$20,010	.....	158,319	.....
Other countries .....	.....	.....	330	.....
Totals .....	\$20,010	\$742	\$158,727	\$12,247

\*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$60 from various countries for February; and \$207 from Great Britain and \$2,106 from various countries for the eleven months ending February, 1916, the values being at treaty rates.

#### EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	February, 1916.		Eleven Months Ending February, 1916.	
	Produce of Canada.	Re-exports of foreign goods.	Produce of Canada.	Re-exports of foreign goods.
MANUFACTURED—(dutiable):	Value.	Value.	Value.	Value.
Belting:				
To Great Britain .....	.....	.....	\$150	.....
United States .....	.....	.....	424	\$58
Newfoundland .....	.....	.....	1,000	.....
Other countries .....	.....	.....	33	.....
Totals .....	.....	.....	\$1,607	\$58
Hose:				
To Great Britain .....	\$8,974	.....	\$23,599	.....
United States .....	.....	.....	3,976	\$201
Newfoundland .....	.....	.....	3,233	.....
Other countries .....	5,214	.....	16,518	.....
Totals .....	\$14,188	.....	\$47,326	\$201
Boots and shoes:				
To Great Britain .....	\$157,359	.....	\$737,648	.....
United States .....	103	\$36	5,633	\$528
Newfoundland .....	10,110	.....	82,712	.....
Australia .....	4,022	.....	30,796	.....
Other countries .....	11,200	.....	34,435	327
Totals .....	\$182,793	\$36	\$889,224	\$855
Mats and matting:				
To Great Britain .....	\$1,293	.....	\$2,547	.....
Other countries .....	5	.....	469	.....
Totals .....	\$1,298	.....	\$3,016	.....
Clothing:				
To Great Britain .....	.....	.....	\$27	\$10
United States .....	.....	\$6	39	208
Newfoundland .....	.....	.....	140	.....
Other countries .....	\$120	.....	182	.....
Totals .....	\$120	\$6	\$388	\$218
*Rubber waste:				
To Great Britain .....	.....	.....	\$6,368	.....
United States .....	\$57,041	.....	532,130	\$1,964
Totals .....	\$57,041	.....	\$538,498	\$1,964
All other mfn., N. O. P.:				
To Great Britain .....	\$96,333	\$251	\$845,841	\$3,952
United States .....	3,128	3,932	103,282	283,946
Newfoundland .....	24	.....	4,975	785
Australia .....	.....	.....	4,576	.....
Other countries .....	18,725	.....	116,070	10
Totals .....	\$118,210	\$4,183	\$1,074,744	\$288,693
†Gum chicle:				
To Great Britain .....	.....	.....	\$10,000	.....
United States .....	\$168,219	.....	808,470	\$112,840
Other countries .....	.....	.....	42,216	1,107
Totals .....	\$168,219	.....	\$860,686	\$113,947

\*During February, 667,400 pounds of rubber waste was exported to the United States, making a total of 8,142,500 pounds for the eleven months ending February, 1916. For the eleven months ending February, 1916, 60,600 pounds was exported to Great Britain.

†During February, 287,111 pounds of gum chicle was exported to the United States. During the eleven months ending February, 1916, 20,000 pounds was exported to Great Britain, 1,456,874 pounds to the United States, and 64,620 pounds to various countries.

#### UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING APRIL 30, 1916.

	April, 1916.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From Dutch East Indies...	725,000	\$503,899	2,215,400	\$1,637,666
French West Africa...	227,300	120,309	862,200	445,822
Gold Coast .....	320,000	156,477	651,200	278,021
Other countries in Africa .....	766,000	412,837	3,104,500	1,668,962
Peru .....	13,600	8,850	603,400	426,533
Brazil .....	3,479,500	2,322,001	10,174,000	7,122,157
British India .....	662,700	509,391	1,708,000	1,316,632
Straits Settlements and dependencies, including Labuan .....	6,278,500	4,744,137	20,792,100	15,866,252
Federated Malay States .....	3,063,900	2,327,250	9,459,300	7,044,779
Ceylon and dependencies .....	1,271,500	997,870	7,988,700	6,236,672
Other countries .....	218,400	148,609	820,800	568,775
Totals .....	17,026,400	\$12,251,620	58,379,600	\$42,612,271
Waste and reclaimed rubber...	548,200	\$90,061	2,455,700	\$287,061
Gutta percha .....	438,500	247,957	2,625,500	1,254,439
MANUFACTURED—				
Apparel, waterproofed .....	.....	\$4,729	.....	\$22,239
Boots and shoes. (dozen pairs) .....	8,790	88,238	69,296	599,009
Insulated wire .....	.....	21,928	.....	167,461
Submarine cables .....	.....	.....	.....	30,292
Automobile tires and tubes...	.....	1,516,859	.....	5,245,995
Motorcycle tires and tubes...	.....	62,169	.....	152,735
Cycle tires and tubes...	.....	41,903	.....	181,643
Tires not specified.....	.....	5,822	.....	20,577

#### EXPORTS.

	April, 1916.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED—				
Apparel, waterproofed:				
To France .....	.....	\$31,288	.....	\$123,156
British South Africa...	.....	30,540	.....	67,422
British East Indies...	.....	21,321	.....	38,695
Australia .....	.....	13,044	.....	96,611
New Zealand .....	.....	7,844	.....	75,842
Canada .....	.....	22,550	.....	67,170
Other countries .....	.....	58,918	.....	279,056
Totals .....	.....	\$185,505	.....	\$747,952
Boots and shoes. (dozen pairs) .....	7,889	\$38,088	29,609	\$150,053
Insulated wire .....	.....	148,740	.....	690,732
Submarine cables .....	.....	83,317	.....	417,053
Automobile tires and tubes...	.....	250,543	.....	1,379,739
Motorcycle tires and tubes...	.....	27,818	.....	123,305
Cycle tires and tubes...	.....	197,894	.....	910,185
Tires not specified.....	.....	67,831	.....	270,109
Manufactures not specified..	.....	503,020	.....	2,182,583

#### EXPORTS—FOREIGN AND COLONIAL.

	April, 1916.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
To Russia .....	1,649,700	\$1,388,721	4,579,600	\$3,324,475
France .....	1,469,900	1,207,739	6,579,500	5,186,094
United States .....	3,962,200	3,212,611	19,047,000	14,442,842
Other countries .....	1,658,200	1,193,208	6,487,000	4,575,904
Totals .....	8,740,000	\$7,002,279	36,693,100	\$27,529,315
Waste and reclaimed rubber...	33,700	\$5,190	197,200	\$32,824
Gutta percha .....	30,300	13,229	190,400	97,171
MANUFACTURED—				
Apparel, waterproofed .....	.....	\$350	.....	\$603
Boots and shoes. (dozen pairs) .....	281	1,696	10,853	62,963
Insulated wire .....	.....	1,881	.....	27,751
Automobile tires and tubes...	.....	186,225	.....	1,202,407
Motorcycle tires and tubes...	.....	4,461	.....	12,124
Cycle tires and tubes...	.....	7,232	.....	65,547
Tires not specified.....	.....	588	.....	3,528

#### RUBBER STATISTICS FOR ITALY.

##### IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Twelve Months Ending December 31, 1914.		Twelve Months Ending December 31, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
From Straits Settlements...	853,160	.....	2,767,600	.....
African Fr. Colony...	64,240	.....	32,120	.....
Belgian Congo .....	179,740	.....	294,580	.....
Brazil .....	5,033,160	.....	7,904,600	.....
Other countries .....	588,500	.....	809,160	.....
Totals .....	6,718,800	\$4,125,954	11,808,060	\$7,251,222
Rubber scrap .....	1,870,440	\$114,862	3,664,100	\$225,009

**MANUFACTURED—**  
India rubber and gutta percha

—threads:				
From Great Britain .....	19,800		54,780	
United States .....	32,120		48,400	
Other countries .....	14,080		3,520	

Totals .....	66,000	\$104,220	106,700	\$168,489
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## India rubber and gutta percha

—sheets:				
Cut sheets .....	3,080	\$4,080	4,620	\$6,120
Elastic fabric .....	11,220	3,445	4,620	1,418
Insulated wire .....	2,420	573	440	104
Hard rubber .....	17,820	10,943	40,480	24,858

## India rubber and gutta percha

—tubes:				
Cut sheets .....	7,480	\$11,155	1,980	\$2,953

Elastic fabric:				
From Austria-Hungary ..	26,400		880	
Germany .....	202,620		5,720	
Other countries .....	26,520		26,520	

Totals .....	255,540	\$114,146	33,120	\$18,535
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Other forms .....	56,980	\$27,492	2,400	\$2,123
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Belting .....	67,320	\$35,434	60,500	\$31,845
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Rubber coated fabrics. (pieces)	27,720	\$29,181	109,120	\$114,873
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Other forms:				
From Austria-Hungary ..	51,480			
Great Britain .....	51,700		47,960	
Other countries .....	44,600		3,300	

Totals .....	147,780	\$97,272	51,260	\$33,726
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## Rubber boots and shoes (pairs):

From Austria-Hungary ..	3,084		1,531	
France .....	376		3,220	
Germany .....	5,792		4,257	
United States .....	23,488		53,743	
Other countries .....	3,459		1,024	

Totals .....	36,199	\$27,945	63,775	\$49,234
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## Elastic webbing:

From Austria-Hungary ..	25,300		5,720	
France .....	27,280		22,660	
Germany .....	167,640		27,280	
Other countries .....	38,940		24,640	

Totals .....	259,160	\$363,766	80,300	\$112,712
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## Tires:

From France .....	950,180		408,760	
Germany .....	1,296,680		2,640	
Great Britain .....	298,980		262,020	
Russia .....	177,980			
Other countries .....	65,120		105,160	

Totals .....	2,788,940	\$3,400,858	778,580	\$929,407
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## Other rubber manufactures:

From Austria-Hungary ..	108,240		13,640	
France .....	26,400		1,611,280	
Germany .....	322,520		63,360	
Great Britain .....	192,280		1,085,480	
Other countries .....	38,060		1,296,240	

Totals .....	684,500	\$301,562	4,070,000	\$1,785,250
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Total Imports .....		\$8,712,888		\$10,757,878
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**EXPORTS OF CRUDE AND MANUFACTURED RUBBER.****UNMANUFACTURED—**

India rubber and gutta percha				
—raw and reclaimed .....	595,980	\$133,323	729,080	\$163,098
Rubber scrap .....	337,920	\$20,751	36,080	\$2,415

**MANUFACTURED—**

## India rubber and gutta percha

—threads:				
To Austria-Hungary .....	2,400			
Germany .....	48,840		5,720	
Great Britain .....	660		1,980	
Russia .....	2,420			
Argentina .....	2,420		7,040	
Other countries .....	25,300		64,900	

Totals .....	82,040	\$132,706	79,640	\$125,758
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## India rubber and gutta percha

—sheets:				
Cut sheets .....	7,260	\$9,626	14,520	\$19,234
Elastic fabric .....	880	270	1,980	608
Insulated wire .....			1,100	260
Hard rubber .....	880	540	20,680	12,699

## India rubber and gutta percha

—tubes:				
Cut sheets .....	880	\$1,312	14,740	\$21,982
Elastic fabric .....	34,980	15,036	98,120	42,178
Other forms .....	55,880	26,962	75,240	36,303
Belting .....	11,660	6,137	6,160	3,242
Rubber coated fabrics. (pieces)	20,020	14,050	112,420	78,898
Rubber boots and shoes. (pairs)			50	38

## Elastic webbing:

To Austria-Hungary .....	2,640			
France .....	6,380		6,600	
Egypt .....	11,440		11,220	
Argentina .....	28,160		73,260	
Brazil .....	66,880		89,760	
Cuba .....	23,760		36,960	
Other countries .....	82,060		182,380	

Totals .....	221,320	\$310,652	400,180	\$561,707
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## Tires:

To Austria-Hungary .....	1,195,700			
Belgium .....	54,780			
France .....	111,760		378,840	
Germany .....	645,920			
Great Britain .....	4,581,720		3,204,960	
Switzerland .....	403,700		215,600	
Australia .....	83,820		55,660	
Argentina .....	434,720		1,126,840	
Brazil .....	87,560		423,500	
Other countries .....	629,420		3,316,280	

Totals .....	8,229,100	\$6,934,371	8,721,680	\$10,635,295
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## Other rubber manufactures:

To Great Britain .....	133,540		61,600	
Argentina .....	81,620		90,640	
Other countries .....	259,820		434,063	

Totals .....	474,980	\$295,847	586,303	\$365,185
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Total Exports .....		\$7,901,583		\$12,068,600
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**IMPORTS OF CRUDE RUBBER AND BALATA AT BORDEAUX, FRANCE.**

	1916.			
	January.	February.	March.	April.
Conakry and Rio Nounex.....pounds	185,900	19,800	314,600	107,800
Upper Congo .....	183,700		193,600	363,000
Ivory Coast Flakes .....	8,580		33,000	37,840
Madagascar .....	4,180			14,300
Manicoba .....	1,980	3,520		14,080
Casamance .....	11,440	6,160	15,400	13,640
Soudan Niggers .....				47,300
Lahou Cakes .....				21,120
Bissao Niggers .....				38,500
Totals, rubber .....	395,780	29,480	556,600	657,580
Balata .....	56,100			

**THE RUBBER SCRAP MARKET.**

## NEW YORK.

It would appear that the rubber scrap market has maintained a fairly steady position during the entire month despite the unfavorable influence reflected by the declining rubber market. Early in the month boots and shoes were firm at 8½ cents and dealers refused offers around 8½ cents from the reclaimers, and in some cases as high as 9 cents was asked. Steady buying was noticed the first week of the month on the part of several large dealers who evidently believed the present market has reached the bottom, and it was freely predicted that the reclaimers and rubber mills would be in the market before the end of the month. It is believed that there has been considerable tentative buying on the part of these interests which would substantiate this forecast.

The tire situation has been limited to small transactions controlled through price concessions by those who were anxious to sell, however, the dealers, for the most part, have asked 8½ cents for white G. & G. tires, delivered. Other grades of tires were unchanged, and No. 1 inner tubes were nominally 29 cents. The mechanical grades developed a tendency early in the month to lower prices, as buyers were not so keen for supplies as they were a week ago.

By the 20th of the month certain grades exhibited strength, particularly boots, shoes and arctics, due to the recent curtailment of arrivals. Boots and shoes were going in good volume at 9 cents delivered, though some dealers held out for 9½ cents. Arctics developed a firm tone in sympathy, the leading trimmed grades being delivered to the mills for 7 cents.

In white G. & G. tires the situation had not changed materially, though sales at 8½ cents delivered were reported. Mixed tires presented the anomaly of dealers buying at 6 cents and selling at 6½ cents delivered. Bicycle tires moved freely at prices ruling between 4½ and 4½ cents. Inner tubes were dull and easier in price, the No. 1 grade being quoted nominally at 27½ cents. White mechanical scrap appeared to move freely at prices ranging between 14½ and 15½ cents delivered, while the other grades failed to attract any interest whatsoever. There is no demand for garden hose, and the other grades were exceedingly dull.

A special form of rubber guarantee has been issued by the British consul at New York for use by the reclaimers. The rubber scrap dealers will continue to sign the same form.



# NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED. MAY 29, 1916.

Prices subject to change without notice.

	Per Pound.
Boots and shoes	\$0.0890 @ 0.09
Trimmed arctics	.08 1/2 @ .08 1/2
White tires, Goodrich and Goodyear	.08 1/2 @ .08 1/2
Auto tires, standard white	.0630 @ .0640
standard mixed	.0630 @ .0640
stripped, unguaranteed	.04 1/2 @ .04 1/2
Auto peelings, No. 1	.09 1/2 @ .10
No. 2	.08 1/2 @ .08 1/2
Inner tubes, No. 1	.27 @ .27 1/2
No. 2	.12 @ .12 1/2
red	.12 1/2 @ .13
Irony tires	.02 @ .02 1/2
Bicycle tires	.04 1/2 @ .04 1/2
Solid tires	.05 1/2 @ .05 1/2
White scrap, No. 1	.15 @ .15 1/2
No. 2	.10 @ .11
Red scrap, No. 1	.10 1/2 @ .11 1/2
No. 2	.08 @ .09
Mixed black scrap, No. 1	.04 @ .04 1/2
No. 2	.03 1/2 @ .03 1/2
Rubber car springs	.04 1/2 @ .04 1/2
Horse shoe pads	.01 @ .01 1/2
Matting and packings	.01 1/2 @ .01 1/2
Garden hose	.05 1/2 @ .05 1/2
Air brake hose	.02 1/2 @ .02 1/2
Cotton fire hose	.01 1/2 @ .01 1/2
Large hose	.25 @ .26
Hard rubber scrap, No. 1, bright fracture	.03 @ .03
Battery jars (black compound)	.03 1/2 @ .03 1/2
Insulated wire stripping	.03 1/2 @ .04
Rubber heels	

## MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

THE bullish sentiment of the past month is doubtless due to the belief that the war will be over within a year, and restoration of peace will result in a sharp advance in the cotton market. The other side of the question, however, is supported by the fact that the estimated 3,000,000 bales now consumed annually abroad for war purposes will stop short and that our own mills also will face curtailment, with a depressing effect on values. As for the crop, every effort is being made to make it a large one. The estimated production for 1915 in the United States, India and Egypt is 15,950,000 bales.

### EGYPTIAN COTTON.

Sakellarides, Mit Afifi and Nubari are the grades used for tire fabrics and are set down in the order of their importance. Last year England cut the total production 40 per cent by limiting acreage. This year it is a different story, as conclusively shown in the following table of comparative figures:

### PERCENTAGE PLANTED.

Year.	Total Acreage.	Sakellarides.	Mit Afifi.	Nubari.	Others.	Total Crop Yields. (Pounds.)
1913...	1,723,094	14.3	36.2	11.7	37.8	768,417,200
1914...	1,755,270	22.5	26.6	14.9	36	634,676,800
1915...	1,186,004	46.2	17.7	9	27.1 (?)	400,000,000
1916...	1,930,000	50	17	8	25 (?)	700,000,000

The normal yearly consumption of Egyptian cotton in tire fabrics is under 100,000 bales; however, this year 200,000 bales are confidently predicted.

### SEA ISLAND COTTON.

The average increase in acreage is reported to be 21 per cent for Georgia, with 10 per cent requiring planting, and 8 per cent for Florida, with 33 per cent requiring replanting. Crop conditions in the entire district are poor to fair, due to dry weather and a late spring.

Last year's crop was 78,000 bales, of which 62,000 bales went into tire fabrics. Efforts are being made to bring the total production for this year up to 100,000 bales. The crop in sight at all ports on May 19 is 68,516 bales against 65,116 a year ago.

### TIRE FABRICS.

The activity in tire fabrics has continued during the month and the mills are reported as sold up to the first of the coming year. It still continues to be a seller's market with delivery the prime factor and price and quality of secondary consideration. Toward the end of the month the pressure for building fabric lessened somewhat, though the accessory fabrics continued scarce. The dull season for tire making is at hand and labor curtailment has already occurred in some quarters which should predict easier conditions in fabrics for the immediate future, at least.

## COTTON DUCK.

In general the story is practically a repetition of last month, with a greater demand, however, for home deliveries of hose and belting duck. Foreign business has consumed all available stocks and is now affected adversely by the embargo, while domestic orders are appearing in good volume at higher prices. Orders are taken only for December 1916 delivery.

### DRILLS AND SHEETINGS.

These continue to be scarce; particularly the drills and twills in widths of 55 and 65 inches. These are in great demand and some mills are putting on double shift to meet contract deliveries. Business is now being written for July 1917 deliveries.

## NEW YORK QUOTATIONS.

MAY 29, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:	
Wamsutta, S. A. I. L. No. 1, 40-inch	yard \$0.25 @
No. 4, 38 1/2-inch	.25 @
O/X B. 36-inch	.12 1/2 @
Wool Stockinettes—52-inch:	
A—14-ounce	yard 1.12 1/2 @
B—14-ounce	1.25 @
C—14-ounce	1.50 @
Cotton Stockinettes—52-inch:	
D—14-ounce	yard .49 @ .50
E—1 1/2-ounce	.39 @ .40
F—1-ounce	.53 @ .54
G—8-ounce	.43 @ .44
H—11-ounce	.48 @ .49
I—9-ounce	.40 1/2 @ .41 1/2
Colors—white, black, blue, brown.	

Tire Fabrics:	
17 1/4-ounce Sea Island, combed	square yard .75 @ .76
17 1/4-ounce Egyptian, combed	.64 @ .70
17 1/4-ounce Egyptian, carded	.61 @ .67
17 1/4-ounce Peckers, carded	.44 @ .46

Sheeting:	
40-inch 2.35-yard	yard .10 1/2 @
40-inch 2.50-yard	.10 @
40-inch 2.70-yard	.09 1/2 @
40-inch 2.85-yard	.08 1/2 @
40-inch 3.15-yard	.08 1/2 @

Osnaburghs:	
40-inch 2.25-yard	yard .11 1/2 @
40-inch 2.48-yard	.10 1/2 @
37 1/2-in. 2.42-yard	.10 1/2 @

Mechanical Ducks:	
Hose	yard .28 @ .28 1/2
Belting	.28 @ .28 1/2

Carriage Cloth Duck.	
38-inch 2.00-yard enameling duck	yard .13 1/2 @
38-inch 1.74-yard	.15 1/2 @
72-inch 16.66-ounce	.33 @
72-inch 17.21-ounce	.34 @

Drills:	
38-inch 2.00-yard	yard .14 @
40-inch 2.47-yard	.11 @
52-inch 1.50-yard	.15 @
52-inch 1.95-yard	.14 1/2 @
60-inch 1.52-yard	.20 @

Yarns:	
Garden Hose, 12/2 cabled	yard \$0.28 @ .30
Fire Hose 12/1	.27 @ .29

Imported Woolen Fabrics Specially Prepared for Rub-	
bering—Plain and Fancies:	
63-inch, 3 1/4 to 7 1/2 ounces	square yard .38 @ 1.55
36-inch, 2 1/4 to 5 ounces	.35 @ .85

Imported Plaid Lining (Union and Cotton):	
63-inch, 2 to 4 ounces	square yard .33 @ .75
36-inch, 2 to 4 ounces	.20 @ .45

Domestic Worsted Fabrics:	
36-inch, 4 1/2 to 8 ounces	square yard .25 @ .45
Domestic Woven Plain Linings (Cotton):	
36-inch, 3 1/4 to 5 ounces	square yard .15 1/2 @ .20

Raincoat Cloth (Cotton):	
Bombazine	yard .06 @ .08
Tweeds	.10 @ .15
Tweed, printed	.06 @ .15
Plaid	.07 1/2 @ .10
Repp	.18 1/2 @ .25

Burlaps:	
32-7 1/4-ounce	100 yards none
40-7 1/4-ounce	6.75 @
40-8-ounce	6.85 @
40-10-ounce	8.60 @
40-12-ounce	8.75 @
45-7 1/4-ounce	8.25 @
45-8-ounce	8.50 @
48-10-ounce	13.50 @

## THE MARKET FOR CHEMICAL AND COMPOUNDING INGREDIENTS.

**ANILINE OIL.** There has been an increased production without corresponding increased demand. This, with decrease of exports, caused a drop in prices.

**ANTIMONY SULPHURETS.** There has been a steady market during the month at fixed prices.

**BARYTES.** Mill conditions have resulted in sub-normal production and the maintenance of high prices.

The production of crude barytes in the United States in 1915 was 108,547 short tons, valued at \$381,032. As compared with the production in 1914, which was 52,747 short tons, valued at \$155,647, this is a remarkable showing, and reports collected by James M. Hill, of the United States Geological Survey, indicate that the production in 1915 will be continued if not exceeded in 1916.

The general feeling of the trade is that this boom is not to be short-lived, particularly in view of the large demand for crude barytes by the newly established barium chemical industry.

**BENZOL.** This material has been in active demand with tendency to lower price for the pure grade; 100,000 gallons are said to have been offered at 72½ cents.

**LITHARGE.** The supply has been the largest in the history of the industry but not adequate to meet the demand. Prices have remained unchanged for weeks.

**LITHOPONE.** There was an accumulation of stocks early in the month and the price was weak, in sympathy with zinc oxide. Later the market dropped slightly, holding its own at 14¼@15 cents for second hand sales.

**SOAPSTONE AND TALC.** The United States has long been the leading nation in the production of talc and soapstone, and its production of late is increasing. The output of talc for 1915 was 166,336 short tons, valued at \$1,401,197, and of soapstone 20,555 short tons, valued at \$490,385, according to J. S. Diller, of the United States Geological Survey.

**WHITING.** Consumers of whiting who are covered on contracts are in an advantageous position, for the tendency of the market has been upwards, and an advance of 10 cents per 100 pounds has been effective over the prices quoted on contracts at the close of last year. The spot market is firm.

**ZINC OXIDES.** On the 12th of the month the principal American producer announced a new price list, effective July 1 and running the rest of the year. Prices have been advanced somewhat.

#### NEW YORK QUOTATIONS, MAY 29, 1916.

(Subject to change without notice.)

Acetone (drums) .....	lb.	\$0.41	@
Acid, acetic, 28 per cent. (bbls.) .....	lb.	.07½	@ \$0.08
creosylic (crude) .....	gal.	.75	@ .80
glacial, 99% (carboys) .....	lb.	.45	@ .50
muriatic, 20" .....	lb.	.02¼	@ .03
nitric, 36" .....	lb.	.06¼	@ .06½
sulphuric, 60" .....	lb.	.01¼	@ .02
Alumina Pigment, No. 1 (sacks and bbls.) .....	ton	14.00	@ 19.00
Aluminum Flake (carloads) .....	ton	22.00	@ 19.00
Ammonium carbonate .....	lb.	.09½	@ .10
Antimony, crimson, sulphuret of (casks) .....	lb.	.80	@ .90
crimson, "Mephisto" (casks) .....	lb.	.80	@ .90
golden, sulphuret of (casks) .....	lb.	.50	@ .50
golden, "Mephisto" .....	lb.	.50	@ .50
golden, sulphuret, States brand, 16-17% .....	lb.	.65	@ .65
Asbestos .....	ton	19.50	@ 21.00
Asphaltum "G" Brilliant .....	ton	25.00	@ 25.00
Barium sulphate, precipitated .....	ton	160.00	@ 160.00
Barytes, pure white .....	ton	40.00	@ 40.00
off color .....	ton	25.00	@ 28.00
Bisulfur .....	ton	160.00	@ 160.00
Benzol, pure .....	gal.	.70	@ .80
Beta-Naphthol .....	lb.	1.35	@ 1.50
Black Hypo .....	lb.	.45	@ .45
Bone ash .....	lb.	.04	@ .08
black .....	lb.	.04	@ .08
Cadmium tri-sulphate .....	lb.	.27½	@ .35
yellow .....	lb.	.08½	@ .09
Castella gum .....	lb.	.25	@ .25
Carbon, black (cases) .....	lb.	.18	@ .18
tetrachloride (drums) .....	lb.	.06¼	@ .06¼
Caustic soda, 76 per cent. .....	lb.	.04½	@ .05¼
Chalk, precipitated, extra light .....	lb.	.04	@ .04
precipitated, heavy .....	lb.	.04	@ .04
China clay, domestic .....	ton	14.00	@ 14.00
imported .....	ton	40.00	@ 45.00
Chrome, green .....	ton	20	@ 24
yellow .....	ton	42	@ 70
Coal tar .....	bbbl.	4.50	@ 4.50
Corn oil, refined .....	bbbl.	10.71	@ 10.71
Cotton linters .....	lb.	.04	@ .08
Gas black .....	lb.	.22	@ .25
Gilsonite .....	ton	40.00	@ 40.00

Glycerine, C. P. (drums) .....	lb.	.59	@
Graphite, flake (400 pound bbl.) .....	lb.	.28	@
powdered (400 pound bbl.) .....	lb.	.70	@
Green oxide of chromium (casks) .....	lb.	.70	@ .80
Ground glass (fine) .....	lb.	.06	@
Indian red, reduced grades .....	lb.	.04	@
pure .....	lb.	.06	@
Infusorial earth, powdered .....	ton	60.00	@ 60.00
bolted .....	ton	60.00	@ 60.00
Iron oxide, red, reduced grades .....	lb.	.03	@ .08
red, pure, bright .....	lb.	.08½	@ .09
Ivory, black .....	lb.	.16	@ .30
Lampblack .....	lb.	.12	@ .18
Lead, red oxide of .....	lb.	.09¼	@
sublimed blue .....	lb.	.08¼	@
white, basic carbonate .....	lb.	.08¼	@
white, basic sulphate .....	lb.	.08¼	@
Lime, flour .....	lb.	.01¼	@ .01½
Litharge .....	lb.	.09¼	@ .11½
English .....	lb.	.10	@ .11
Lithopone, Imported .....	lb.	.15	@
Magnesia, carbonate .....	lb.	.13	@ .14
calcined, heavy .....	lb.	.45	@ .50
heavy, Thistle Brand .....	lb.	.14	@ .50
light .....	lb.	.45	@ .50
Magnesite, calcined, powdered .....	ton	35.00	@ 39.00
Mica, powdered .....	lb.	.03½	@ .05½
Mineral rubber .....	lb.	.05	@
"U. S. R. X" .....	ton	100.00	@ 100.00
"U. S. R. Y" .....	ton	36.50	@ 36.50
"U. S. R. Z" .....	ton	50.00	@ 50.00
"Richmond Brand" .....	lb.	.03	@
"No. 64 Brand" .....	ton	40.00	@ 40.00
Naphtha, stove gasoline (steel bbls.) .....	gal.	.24	@
66@68 degrees .....	gal.	.28	@
68@70 degrees .....	gal.	.29	@
V. M. & P. .....	gal.	.23	@
Oil, aniline .....	lb.	1.30	@
linseed (bbl.) .....	gal.	.77	@ .81
palm .....	gal.	.16	@ .20
paraffin .....	gal.	.17	@
pine (cases) .....	gal.	.70	@
rapeseed .....	gal.	1.05	@ 1.15
rosin, heavy body .....	gal.	.30	@
tar (cases) .....	gal.	.22	@
soluble aniline colors, yellow, orange, red, violet, blue, green .....	lb.	None	@
Orange mineral, domestic .....	lb.	.12	@ .12½
Paragol (carloads) .....	ton	10.14	@ 10.14
Petroleum grease .....	lb.	.03¼	@ .04½
Pine solvent .....	lb.	None	@
Pine tar .....	bbbl.	6.50	@
Pitch, burgundy .....	lb.	.04	@ .05
pine .....	lb.	.01¼	@
Plaster of paris .....	lb.	1.50	@ 1.70
Prussian blue .....	lb.	2.00	@ 2.50
Pumice stone, powdered (bbls.) .....	lb.	.03	@
Resin, Pontianak, refined .....	lb.	.17	@
granulated .....	lb.	.15	@
fused .....	lb.	None	@
Resin (280 pound bbls.) .....	bbbl.	5.00	@
Rotten stone, powdered .....	lb.	.02½	@ .04
Rubber black .....	lb.	.04½	@
Rubber substitute, black .....	lb.	.13	@ .15
white .....	lb.	.09	@ .12
brown .....	lb.	.09	@ .12
Rubhide .....	lb.	None	@
Shellac, fine orange .....	lb.	.26½	@ .27½
Soapstone, powdered .....	ton	10.00	@ 12.50
Starch, corn, powdered .....	lb.	.03¼	@
Sulphur chloride (drums) .....	lb.	.09	@
Sulphur, flour, velvet, Brooklyn brand (carloads) .....	cwt.	2.20	@ 2.20
Talc, American .....	ton	9.00	@ 13.00
French .....	ton	15.00	@ 24.00
Toluol, pure .....	gal.	4.50	@ 4.75
Tripolite earth, powdered .....	lb.	.02¼	@ .03½
bolted .....	lb.	None	@
Turpentine, pure gum spirits .....	gal.	.45	@ .45
wood .....	gal.	.43	@ .45
Vermilion, brilliant .....	lb.	1.00	@ 1.25
Chinese .....	lb.	.95	@ 1.00
English .....	lb.	1.50	@ 1.60
Wax, bayberry .....	lb.	.22	@ .25
beeswax, white .....	lb.	.47	@ .55
ceresin, white .....	lb.	.10	@ .16
carnauba .....	lb.	.25¼	@ .42
ozokerite, black .....	lb.	.60	@ .85
montan .....	lb.	.80	@ .90
paraffin, refined, 118/120 m. p. (cases) .....	lb.	.28	@ .30
123/125 m. p. (cases) .....	lb.	.05¼	@ .06¼
128/130 m. p. (cases) .....	lb.	.06¼	@ .07
133/136 m. p. (cases) .....	lb.	.07¼	@ .08
crude, white, 117/119 m. p. (bbls.) .....	lb.	.04¼	@ .05¼
yellow, 124/126 m. p. (bbls.) .....	lb.	.05¼	@ .06¼
Whiting, Alba .....	cwt.	.55	@ .65
commercial .....	cwt.	.75	@
gilders .....	cwt.	.85	@
Paris, white, American .....	cwt.	.90	@ 1.00
English clifstone .....	cwt.	1.50	@
Wood pulp XXX (carloads) .....	ton	22.00	@ 22.00
Yellow ochre (Satin) .....	lb.	.02	@
Zinc oxide, American process, horsehead brand .....	lb.	.10¼	@
"special" .....	lb.	.10	@
"XX red" .....	lb.	.10	@
French process, green seal, f. o. b. factory .....	lb.	.24¼	@
red seal, f. o. b. factory .....	lb.	.24¼	@
white seal, f. o. b. factory .....	lb.	.25¼	@
Zinc sulphide, pure .....	lb.	None	@



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## RUBBER TIRE IMPORTS INTO THE STRAITS SETTLEMENTS.

The Registrar of Imports and Exports at Singapore, Straits Settlements, recently furnished to the British Board of Trade interesting statistics which show the share of Great Britain, Continental Europe, Japan and the United States in the importation of "competitive merchandise" into the Straits Settlements during the year 1915.

Under the heading "Rubber Tires," these statistics show that out of total imports from the four sources above mentioned, amounting to 2,199,000 Straits Settlements dollars [\$1,231,440]. Japan's share was 1,037,000 Straits Settlements dollars [\$580,720], Great Britain's share was second in importance, amounting to 574,000 Straits Settlements dollars [\$321,440], Continental Europe ranked third with 572,000 Straits Settlements dollars [\$320,000], while the share of the United States was only 16,000 Straits Settlements dollars [\$8,960].



